CCD-F50/F70

SERVICE MANUAL

US Model
Canadian Model

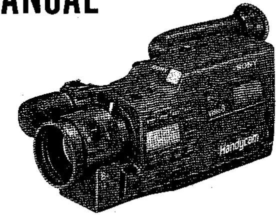


PHOTO: CCD-F70

Handycam
Video 8
O' MECHANISM

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 1.43 cm/sec. LP: Approx. 0.72 cm/sec. (playback only)
Recording time	SP mode: 2 hours (P6–120)
Playback time	SP mode: 2 hours LP mode: 4 hours (P6–120)
Fast forward time	Approx. 6 min. 30 sec. (P6–120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5–68 mm, F1.4 with macro Filter diameter: 46 mm
Auto focus system	Infrared autofocus
Color temperature	Auto: From the light at a tungsten lamp to the light on a slightly overcast day. Preset value: ☀ (5800 k) ✲ (3200 k)
Minimum illumination	4 lux
Illumination range	4 lux–100,000 lux (0.4–9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, −7.5 dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC
Video input	Phono jack, 1 Vp-p, 75 ohms unbalaced, sync negative
Audio input	Phono jack, −7.5 dBs, input impedance more than 47 kilohms
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, −66 dBs, low impedance With 2.5–3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY, ■ (Manual focus ZERO MEM, ☀/✲ LP, FADER; ▣
Caution: ▭, ▣, ▭, ⊗, ⏏
Time/date indication
Title color and mode indication
Shutter speed indication
Tape counter
Recording/battery lamp

— continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements	Battery compartment 6 V (battery pack)/7.5 V (AC power adaptor)/9.0 V (alkaline batteries)
Power consumption	6.5 W (camera recording) including the viewfinder
Installation	Vertically
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Dimensions	Approx. 114 × 131 × 315 mm (w/h/d) ($4\frac{1}{2} \times 5\frac{1}{4} \times 12\frac{1}{2}$ in.) in.)
Weight	Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omini-directional monaural type
Supplied accessories	Lithium battery CR2025 (1) Shoulder strap (1) (CCD-F70) Battery pack NP-55 (1) AC power adaptor AC-V30 (1) RFU adaptor RFU-89UCA (1) Antenna selector (1) Cassette P6-15 (1) (CCD-F70)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

TABLE OF CONTENTS

Section *Title* *Page*

1. GENERAL

1-1. Warning 5
1-2. Identifying the Basic Parts 6
1-3. Power Sources 8
1-4. Cassette Care 11
1-5. Adjustment of the Position of the Viewfinder Lens 11
1-6. Easy Camera Recording with Automatic Adjustments 12
1-7. Insert the Recording [1] 15
1-8. Focusing 16
1-9. White Balance Function 18
1-10. Back Light Adjustment [J] 19
1-11. Shutter Speed Adjustment 19
1-12. Zooming 20
1-13. Close-ups (Macro) 21
1-14. Fade-in and Fade-out Function [N-1] 22
1-15. Recording Date or Time 22
1-16. Recording a Title (CCD-F70) 23
1-17. Use of the BUILT-IN MIC Switch (CCD-F70) 27
1-18. Preparation for Playback 27
1-19. Playback (CCD-F70) 28
1-20. TV Program Recording 29
1-21. Insert Recording [2] 31
1-22. Use of the Tape Counter 32
1-23. Tape Editing 33
1-24. Hints for Better Shooting 34
1-25. Use of the Battery Pack 36
1-26. Note on Moisture Condensation 37
1-27. Precautions 37
1-28. Using Your Recorder Abroad 37

2. DISASSEMBLY

2-1. Removal of Viewfinder 38
2-2. Removal of Cabinet (1) 38
2-3. Removal of Cabinet (2) 38
2-4. Removal of Cabinet (3) 38
2-5. Separating the Camera and VTR Blocks 39
2-6. Removal of VC-61 (CCD IMAGER), VC-62 and VC-63 Boards 39
2-7. Removal of LS LID 40
2-8. Opening the VA-42 Board 40
2-9. Opening the SS-93 Board 40
2-10. Removal of Cassette Arm 41
2-12. Removal of LS Cassette Compartment Assembly 41

Section *Title* *Page*

3. DIAGRAMS

3-1. Circuit Boards Location 42
3-2. Overall Block Diagram 43
3-3. Camera Block Diagram 48
3-4. Auto Focus Block Diagram 53
3-5. Digital Titler Block Diagram 55
3-6. Video Block Diagram 57
3-7. Servo/System Control Block Diagram 61
3-8. Mechanism Controller (μPD78112-GF) 65
3-9. System Control-Camera Block Interface 68
3-10. System Control-Video, Audio Block Interface 69
3-11. System Control-Servo Peripheral Circuit Interface 69
  3-11-1. Timing Chart 1 (PB, EDIT CUE) 71
  3-11-2. Timing Chart 2 (EDIT REVIEW) 71
  3-11-3. Timing Chart 3 (CUE) 71
  3-11-4. Timing Chart 4 (REVIEW) 71
  3-11-5. Timing Chart 5 (REC) 71
3-12. System Control-Peripheral Circuit Interface 72
3-13. Audio Block Diagram 74
3-14. Power Supply Block Diagram 77
3-15. Viewfinder Block Diagram 81

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 83
4-2. Printed Wiring Boards and Schematic Diagrams 87
- VC-61 (CCD Imager), VC-62, VC-63 and DC-21 Boards 87
- VC-61 Board (Auto White Balance) 96
- SS-93 Board (Digital Titler) 103
- SS-93 (REC/PB Amp), VA-42 and MC-36 Boards 110
- SS-93 (Servo/System Control), SW-111, ZM-10, PA-24, CC-7 and FP-53 Boards 120
- FC-25, FV-4, FD-12 and EJ-9 Boards 130
- VF-13, TL-18, and TL-19 Boards 137
- DT-73 Board 142
- MX-7 Board 145
- PR-20 Board 146

4-3. Semiconductors 148

Section *Title* *Page*

5. EXPLODED VIEWS

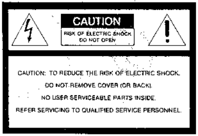
5-1. Right Cabinet Assembly 150
5-2. Left Cabinet Assembly 151
5-3. Cassette Arm and Frame Assembly 152
5-4. LS Cassette Compartment Assembly 153
5-5. Chassis Assembly (1) 154
5-6. Chassis Assembly (2) 155
5-7. Camera Block Assembly 156

Section *Title* *Page*

6. ELECTRICAL PARTS LIST 157
HARDWARD LIST 176

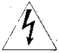
1-1. WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

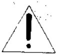

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate the equipment with respect to the receiver

Move the equipment away from the receiver

Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

NOTICE FOR THE CUSTOMERS IN CANADA
This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

SECTION 1
GENERAL

This section is extracted from instraction manual.

The CCD-F50/F70 is a compact video camera recorder combined with a tape recorder. You can record pictures you want and play them back on your television set or color monitor.

Make sure your supplements

The following units are packed with the CCD-F50/F70 video camera recorder.

- Battery pack NP-55 (1)
- AC power adaptor AC-V30 (1)
- RFU adaptor RFU-89UCA (1)
- Antenna selector (1)
- Shoulder strap (1) (CCD-F70)
- Lithium battery CR2025 (1)
- Cassette P6-15 (1) (CCD-F70)

For details on these units, please read their instruction manuals.

How to Use This Manual

How the Manual is Organized

This manual consists of following five sections:

- Power Sources and Cassette Care
- Camera Operation
- VTR Operation
- Hints for Better Shooting
- General (Specifications, Troubleshooting etc.)

If it is the first time for you to use a video camera recorder, you should read Power Sources (page 18), Easy Camera Recording with Automatic Adjustment (page 32) and Playback (page 98).

If you are used to a video camera recorder, you should read Hints for Better Shooting at the end of the volume.

How the Manual Works

The instructions are written in English, French and Spanish.

Please refer to the illustrations on the left side which correspond to the sentences by letter cordes.

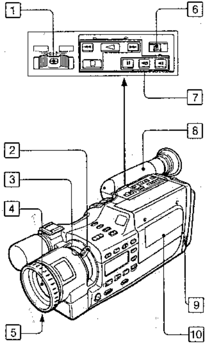
About cassette format

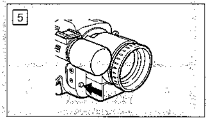
This unit uses 8 mm video format cassettes. It records in the SP mode (approximately 1.43 cm/second) and can play back in the SP mode and the LP mode (approximately 0.72 cm/second).
The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

- Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

1-2. IDENTIFYING THE BASIC PARTS

A-1





For details on the use of each control, refer to the pages indicated in the parenthesis:

A-1

1 **POWER switch**
CAMERA: For camera recording
VTR: For playing back or editing tapes
OFF: Power off

2 **Zoom lever** (page 66)

3 **Macro set button** (page 70)

4 **Focus ring** (page 52)

5 **START/STOP button** (page 34)
Used for low angle recording.

6 ● **REC (recording) switch**
Slide in the direction of the arrow for recording.

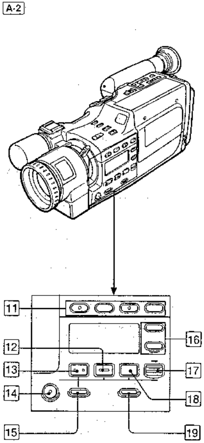
7 **Tape transport buttons**
◁ (playback)
◄◄ FF (fast forward)
►► REW (rewind)
□ (stop)
II (pause)
◄II (frame-by-frame) (CCD-F70)
◄I (slow) (CCD-F70)

8 **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

9 **BATT (battery eject) knob** (page 22)

10 **Cassette holder**

A-2



A-2

11 **SUPERIMPOSE buttons** (page 80) (CCD-F70)
Used to record the title.
TITLE 1 button TITLE 3 button
TITLE 2 button TITLE 4 button

12 **WHITE BAL** (white balance) button

13 **FOCUS button**
Used for manual focusing.

14 **BACK LIGHT button** (page 60)

15 **PUSH AUTO button** (page 54)

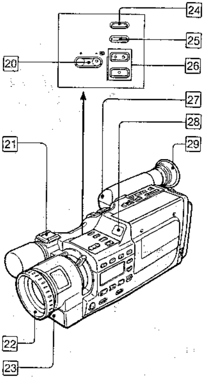
16 **DATE and TIME buttons**
Press to display or turn off the date or time.

17 **AUTO LOCK switch**
Normally set to the upper AUTO LOCK position (green position).

18 **SHUTTER SPEED button** (page 64)
Used to select the shutter speed.

19 **FADER button** (page 72)

A-3



A-3

20 EDITSEARCH ⊟ button

21 Accessory shoe
Attach an optional external microphone, video light, etc.

22 Lens hood

23 Infrared beam emitter
Transmits an infrared beam toward the object to be shot during auto focusing. Do not look into it for a long time when recording with auto focusing. Do not cover here.
Infrared beam detector
The infrared beam reflected from the object to be shot is received here during auto focusing. Do not cover here.

24 COUNTER RESET button
Press to reset the counter to zero.

25 ZERO MEM (zero memory) button
Used to memorize the counter zero point.

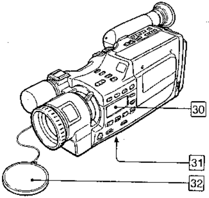
26 MEM (memory) button
COLOR/MODE button (page 78) (CCD-F70)
Used to record the title.

27 Camera recording/battery lamp
Lights during camera recording. It blinks when the battery is exhausted.

28 White balance sensor
This is the sensor for auto white balance adjustment.
During recording, do not cover the sensor.

29 Eyecup

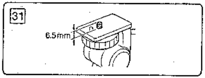
A-4



A-4

30 Display window (page 40)

A-5



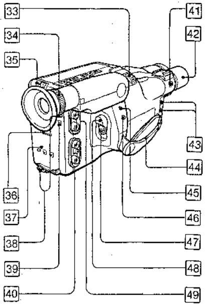
A-5

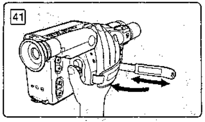
31 Tripod receptacle

Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera.

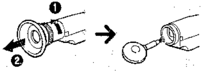
32 Lens cap

A-6





A-7



A-6

33 Power zoom button (page 66)

34 Viewfinder lens adjustment ring (page 30)
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

35 EJECT (cassette eject) button (page 28)

36 Lithium battery compartment (page 26)

37 Battery mounting surface

38 Hooks for shoulder strap
Attach a shoulder strap.

39 EDIT switch (page 118)
Normally set it to the upper position. When editing tapes, set to EDIT.

40 VIDEO/AUDIO OUT (output) jacks (phono jacks)
RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Supplies power to the RFU-89UCA RFU adaptor.

41 BUILT-IN MIC switch (page 92)
Usually set to upper position (green position).

42 Built-in microphone (monaural)

43 MIC jack and DC OUT (microphone power output) jack
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

44 Grip strap
Adjust the length so that your thumb can easily manipulate the START/STOP button.

45 REMOTE connector (stereo mini-minijack)

46 🎧 (earphone) jack (minijack)

47 START/STOP button
Press to start and stop camera recording.

48 STANDBY switch
Slide up to set the unit to recording pause mode.

49 VIDEO/AUDIO IN (input) jacks (phono jacks)

To remove dust from inside the viewfinder A-7
Detach the eyecup as illustrated and clean the surface of the Braun tube with a blower.

1-3. POWER SOURCES

This manual shows the operations on one of the following power sources.

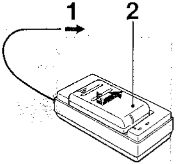
		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor AC-V30 or AC-V55 (page 24)
	Outdoors	Battery pack	Battery pack NP-55 or NP-77 (page 20) Battery case EBP-55 (page 22)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 24) (DCC-16B car battery cord supplied)

Notes on power source

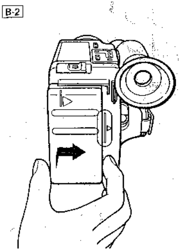
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

Optional Accessories for Charging
- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously
- **BCA-70 or BCA-80 battery charge adaptor, ACP-88 AC pack and NPA-55 battery adaptor**
  For charging, insert an NP-55 into the NPA-55.

B-1



B-2



Battery Pack — NP-55 or NP-77

First, charge the battery pack B-1

Use the AC-V30 AC power adaptor.

The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77 battery pack.

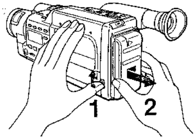
1. **Connect the AC-V30 to a wall outlet.**
2. **Attach the battery pack to the AC-V30.**
   Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack slide it as illustrated.

To attach the battery pack to the video camera recorder B-2

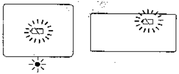
Align the right side of battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.

Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

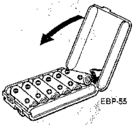
B-3



B-4



B-5



To remove the battery pack B-3

While pressing the BATT knob in the arrow direction, slide to the left and pull out the battery pack as illustrated.

Battery life

A fully-charged NP-55 battery pack provides approximately 40 minutes of continuous camera recording, and an NP-77 provides approximately 80 minutes of continuous camera recording.

Notes

- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, its operating time is also shortened.
- If the phase between the unit and the battery pack is dart, this makes the battery file shorter.

> When the video camera recorder is not in use, remove the battery pack.
> If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

When the battery becomes weak B-4

The 🪫 indication and red lamp blink in the viewfinder and the 🪫 indication blinks in the display window. Replace the battery pack with the fully charged one.

Using the NP-22 battery pack

A fully-charged NP-22 battery pack can operate this unit for approximately 60 minutes. For using the NP-22, an optional NPA-22 battery adaptor is necessary.

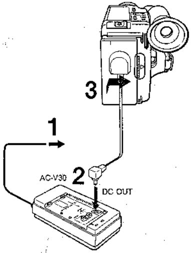
Battery Case EBP-55 B-5

Insert six R6 (size AA) alkaline batteries into the battery case. Connect and remove the case in the same way as the battery pack (page 20, 22).

Notes

- Battery life — Approximately 30 min. (with new batteries, continuous recording, indoors.)
- When batteries become weak, the 🪫 indication may not blink. If the cassette holder does not open, replace new batteries.
- In a cold place, the case can not work.

B-6



House Current — Using AC Power Adaptor B-6

1 Connect the AC power adaptor to a wall outlet.

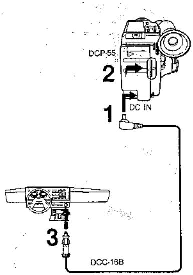
2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.

3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

B-7



Car Battery — Using the DC Pack B-7

1 Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.

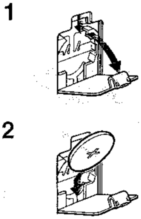
2 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.

3 Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AW car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

C-1



Lithium Battery C-1

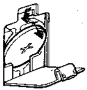
To insert the lithium battery
This unit uses a lithium battery to activate the clock and to keep a title in memory. Before operating the unit for the first time, install the supplied lithium battery:

1 Open the cover of the lithium battery compartment on the battery mounting surface.

2 Install the supplied CR2025 lithium battery with the ⊕ side facing out.

3 Close the cover.

C-2



To remove the lithium battery C-2
Press the side of the battery in the direction as indicated for installation.

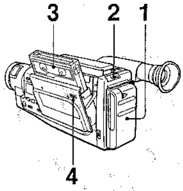
Lithium battery life
Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.

Notes on lithium battery
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Even when the lithium battery is installed, the display window will not light unless power is supplied to the unit.

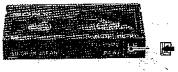
WARNING
Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

1-4. CASSETTE CARE

D-1



D-2



Cassette Insertion D-1

1. **Connect a power source.**
2. **Pressing the small button, slide the EJECT button in the arrow direction.**
   The cassette holder will open.
3. **Insert a cassette with the window facing outside.**
4. **Press the PUSH mark to close the cassette holder.**

Cassette Ejection D-1

1. **Make sure that a power source is connected.**
2. **Pressing the small button, slide the EJECT button in the arrow direction.**
   The cassette holder will open.
3. **Take out the cassette.**
4. **Press the PUSH mark to close the cassette holder.**

To Prevent Accidental Erasure D-2

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

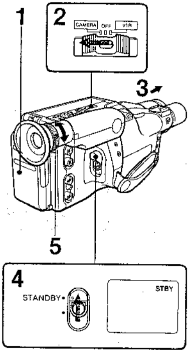
To re-record on the cassette, slide the tab in to uncover the opening.

Notes

- Don't press the upper lid of the cassette compartment forcibly when it is moving.
  When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video-cassette recorder.

1-5. ADJUSTMENT OF THE POSITION OF THE VIEWFINDER LENS

E



The position of the viewfinder lens for optimum vision varies depending on the user. E

1. **Connect a power source.**
2. **While pressing the small button, set the POWER switch to CAMERA.**
3. **Remove the lens cap.**
4. **Slide the STANDBY switch up.**
5. **Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.**

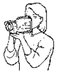
Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

Note

- **If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the STANDBY switch down once and slide it up again.**
- For "once-only" events, it is strongly recommended to have a trial run to check that eveything is working perfectly.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

1-6. EASY CAMERA RECORDING WITH AUTOMATIC ADJUSTMENTS

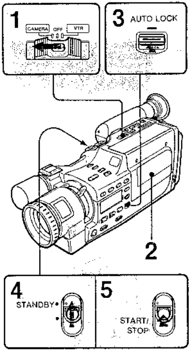
F-1



How to Record

Hold the camera recorder as in the illustration.
If your nose touches the recorder, adjust the angle of the viewfinder. F-1

F-2

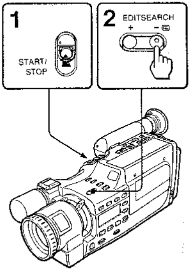


F-2

1. **While pressing the small button, set the POWER switch to CAMERA.**
2. **Insert the cassette.**
3. **Set the AUTO LOCK switch to upper AUTO LOCK position. (green portion)**
4. **Slide the STANDBY switch up.**
   The unit will enter the recording pause mode.
   STBY: Displayed in the viewfinder during recording pause mode.
5. **Press the START/STOP button.**
   Recording will start.
   REC: Displayed in the viewfinder during recording.

To stop recording, press the START/STOP button.
The unit will enter the recording pause mode.
Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

F-3



F-3

To check the last portion of the previous recording

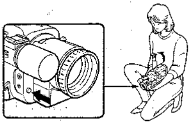
1. **Set the recorder in recording pause mode by pressing the START/STOP button.**
2. **Press the "−" slide to the EDITSEARCH button momentarily.**
   The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

Note

If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CL video head cleaning cassette.

After using
Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

F-4

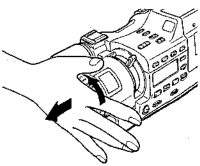


F-4

For low angle recording
The viewfinder can be turned up 90 degrees.

1. **Slide the STANDBY switch up.**
2. **Press the START/STOP button on the front.**

F-5



F-5

When removing the lens hood, press it with the palm of your hand and turn it counterclockwise.

Note on power source

If the POWER switch is moved during recording, the tape will stop.

Notes on light sources

- Should you shoot a subject in bright conditions, such as sunlight, just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VCR

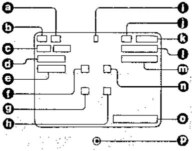
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment

- During recording, do not cover the white balance sensor infrared beam emitter and detector.
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens and the white balance sensor clean.

Under certain conditions, auto focusing will not operate properly (see page 50).

F-6



Indications Inside the Viewfinder and in the Display Window F-6 F-7

[a] ▨ **(Back light)**
The indication lights while the BACK LIGHT button has been pressed.

[b] ☀, ✲ **(White balance)**
Each push of this button cyclically changes functions.
☀: The white balance is outdoor mode.
✲: The white balance is indoor mode.
When the indication does not light, the white balance is set to auto.

[c] **Title number, mode and colour** (see page 78) (CCD-F70)

[d] **Shutter speed** (see page 64.)

[e] **FADER** (see page 72)
The indication lights while the FADER button has been pressed.

[f] ▭
The indication blinks slowly when the battery is weak and blinks rapidly when the battery is exhausted.

[g] ▣ **(Dew)**
The indication blinks when moisture condensed inside the unit.

[h] ⊗ /⏏
the indication blinks when the unit cannot function normally.
The indication blinks when the gap of the head is clogged.
Clean the heads using the video head cleaning cassette.

[i] ■
The indication lights while manual focusing.
While auto focus function does not operate correctly, the indication blinks.

[j] **LP**
The indication lights when playing back in the LP mode.

[k] **STBY/REC**
The indication lights in the following modes.
STBY
Recording is momentarily stopped (recording pause mode).
REC
Recording is going on.

[l] **Tape counter**

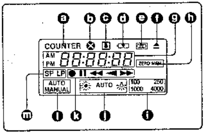
[m] **ZERO MEM**
The indication blinks when the ZERO MEM button is pressed.

[n] ▭ **(Tape end)**
The indication blinks slowly when the tape is out or close to the end. The indication blinks rapidly when the tape is at its end.

[o] **Date or Time**

[p] **Camera recording/battery lamp**
The indication lights during camera recording.
It blinks when the battery is weak.

F-7



F-7

ⓐ COUNTER indicator
ⓑ Blinks when the slit in the head is clogged.
ⓒ Moisture condensation inside the unit.
ⓓ Blinks when the battery is weak.
ⓔ Lights steadily when no cassette is inserted. Blinks when the tape approaches its end or the safety tab of the inserted cassette is slid out (red).
ⓕ Lights steadily during cassette ejection. Blinks when the unit cannot function normally.
ⓖ Indicates the time or the tape counter.
ⓗ ZERO MEM (memory) indicator
ⓘ Shutter speed indicator
ⓙ White balance indicator
ⓚ Tape operation mode indicators
ⓛ Recording mode indicator
ⓜ Tape speed indicator

Function of the AUTO LOCK Switch

When the AUTO LOCK switch is set to AUTO LOCK (green position), the white balance, shutter speed (1/60), and focus are adjusted automatically. The back light function does not work. But under certain circumstances, manual adjustment is better for effective recording.

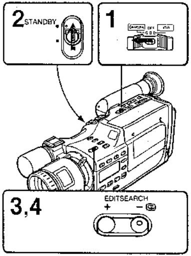
When the AUTO LOCK switch is set to the lower position, each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BALANCE See page 58.	No indiction (Auto) → ☀ → ☼
SHUTTER SPEED See page 62.	No indication (1/60) → 100 → 250 → 1000 → 4000
FOCUS See page 52.	No indication (Auto) → ■ (Manual)
BACK LIGHT See page 60.	No indication → ▨

Notes

- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the lower position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the lower position again, the previous manual setting will be recalled.

F-8



Instant Playback on the Spot F-8

You can monitor the picture just recorded on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

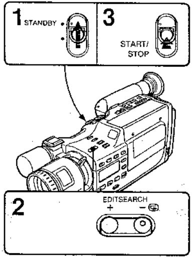
2 **Slide the STANDBY switch up.**

3 **Press the "–" side of the EDITSEARCH button to reverse the picture.**

4 **Press the "+" side of the EDITSEARCH button to view the playback picture.**

Note
While monitoring the picture in the viewfinder screen, the sound will be muted.

F-9



During Recording, to Record Again on the Previous Recorded Portion F-9

Normally, smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as below.

1 **Slide the STANDBY switch up.**

2 **Locate the point from which the recording is to begin again by monitoring the picture on the viewfinder screen.**
Press the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "–" side to reverse the picture.

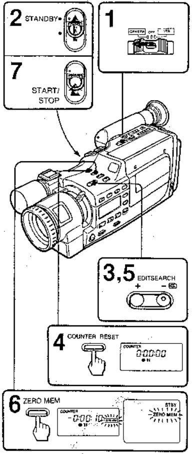
Release the EDITSEARCH button at the desired point.
The unit will be set to recording pause mode.

3 **Press the START/STOP button to start recording.**

1-7. INSERT THE RECORDING 1

G-1

G-2



G-1

You can insert (record) video and audio simultaneously from the camera onto any recorded tape.

Operation G-2

When performing insert recording, the playback picture can be monitored on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide the STANDBY switch up to set the unit to recording pause mode.**

3 **Keep pressing the "+" or "−" side of the EDITSEARCH button and release the button at the point where the insert should end.**
The unit will be set to recording pause mode.

4 **Display the counter in the display window and press the COUNTER RESET button.**
The counter is reset to zero.
(For an accurate ending point, press the RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)

5 **Keep pressing the "−" side of the EDITSEARCH button and release the button at the point where the insert should begin.**

6 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

7 **Press the START/STOP button.**
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To insert the date or time

1 **Follow steps 1 through 6 given above.**

2 **Press the DATE or TIME button.**
The date or time indication appear on the viewfinder screen.

3 **Press the START/STOP button.**
The insert recording will begin.

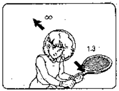
Notes on ZERO MEM mode
ZERO MEM mode is cancelled automatically in the following cases.
- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

To restore it, press the ZERO MEM button again.

Notes
- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

1-8. FOCUSING

H-1



Auto Focus Function

Auto focusing system of this camera recorder
This recorder adjusts focus automatically by emitting an infrared beam at the objects to be shot and then detecting the reflected beam. When the subject is approximately 3 meters away from the camera recorder, the focus is sharpest in the center of the screen. The camera recorder has the tendency, however, to focus a bit lower to the right when the subject is within 3 meters, and a bit higher to the left when the subject is more than 3 meters away. H-1

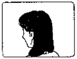
As the auto focusing of this camera recorder utilizes an infrared beam, it might malfunction when you use the camera recorder near another equipment that also emits an infrared beam such as a TV or VCR remote commander, or another camera recorder that uses an infrared beam for auto focusing.
It might also cause malfunctioning of such equipment.

Manual Focus Function

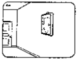
Under most shooting condition, the Auto Focus function of this unit brings the subject into focus automatically. However, there are some conditions in which the Auto Focus function may not operate correctly. Under the conditions given next use the manual focusing function.

H-2

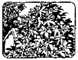
[a]



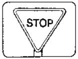
[b]



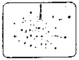
[c]



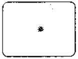
[d]



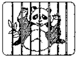
[e]



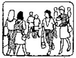
[f]



[g]



[h]



Poor Conditions for Auto Focusing H-2

To shoot subjects listed below you must use manual focusing.

[a] Black objects which absorb the infrared beam
Ex. dark curtains or shade

[b] Objects in which the infrared reflection disperses
Ex. a smooth slanting surface (Auto focusing functions when the camera is aimed squarely at the subject.)

[c] Objects in which the infrared reflection is not sufficient
Ex. bushes, grass or plants in the telephoto position

[d] Objects in which the infrared beam is reflected too much
Ex. traffic signs, a white wall, a mirror, or a subject through plate glass

[e] Objects not solid
Ex. fireworks, candle flame or smoke

[f] Extremely small objects which do not cover more than 1/10 of the viewfinder's area
Ex. insects

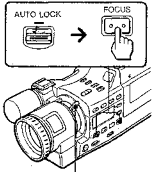
[g] When there are other objects between the shooting object
Ex. an animal inside a cage or baby inside a cot

[h] Moving objects
Ex. a crowd or sports with lots of movement

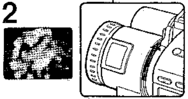
- **Objects which emit infrared beams themselves**
  Ex. automatic doors or fluorescent lights
- **Objects more than 15 meters (49 feet) away from the recorder**

H-3

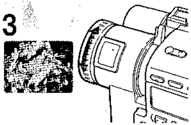
1



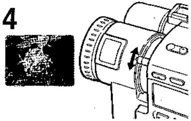
2



3



4



How to Use the Manual Focus Function H-3

1 **Set the AUTO LOCK switch down and press the FOCUS button.**

The previous manual focus setting will be recalled.

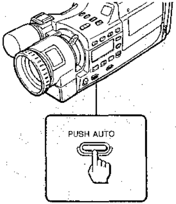
2 **Turn the manual zoom lever to the telephoto position (68) to make the subject as large as possible in the viewfinder.**

3 **Turn the focus ring to obtain sharp focus.**

4 **Set the desired shot length using the zoom lever.**

It is also set using the power zoom button.

H-4



Some helpful hints

- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position (8.5) and the focus ring to 2 m. regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the Φ mark.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

Other Uses of Manual Focusing

- When using special effect lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (When the AUTO LOCK switch is set to AUTO LOCK, the auto focusing operates to move the focus ring automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 68.

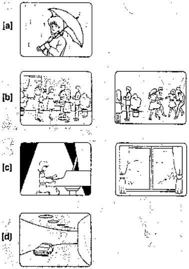
Instant Auto Focus during Manual Focusing H-4

While recording in manual focusing, you can switch to the automatic focus mode depending upon the shooting condition by pressing the PUSH AUTO button. The automatic focus function is active while the button is pressed.

To return to the manual focusing, release the PUSH AUTO button.

1-9. WHITE BALANCE FUNCTION

I-1



Automatic White Balance Function

In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

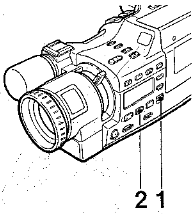
Manual White Balance Function

I-1

In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

[a] Insufficient light
[b] When lighting conditions change quickly
[c] When the light source for the subject is different from that illuminating this unit e.g. when the subject is in a spotlight, or when the subject is outdoors but the camera is indoors, etc.
[d] Special light sources such as natrium lamps, the setting sun, etc.

I-2



How to Use the Manual White Balance Function I-2

1 **Set the AUTO LOCK switch down.**
The white balance mode is the same as the previous mode.

2 **Press WHITE BAL button once or twice so that the appropriate white balance indicator appears on the viewfinder screen.**
To record the subject indoors (3200 K): 💡
To record the subject outdoors (5800 k): ☀

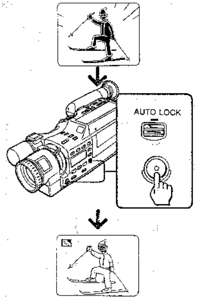
Recommended setting for various subjects
indoor: coming in from outdoor to indoor, candle flames in darkness, subjects in the spotlight, scenes before sunrise, subjects in a tunnel (illuminated by natrium lamps), neons, etc.
outdoor: getting out from indoor to outdoor, sunset, fireworks, subjects in a sunny window, etc.

Note
Do not cover the white balance sensor.

Each push of the WHITE BAL button cyclically changes each function.	
Display window	AUTO → ☀ → 💡 ↺
Viewfinder screen	No indication → ☀ → 💡 ↺

1-10. BACK LIGHT ADJUSTMENT J

J



In this unit iris is automatically controlled. However, when shooting a subject that is backlit, that is the light source is coming in from the back of the subject, you should do the following steps.

1. **Set the AUTO LOCK switch down.**
   The previous back light mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

2. **Press the BACK LIGHT button.**
   The ▨ indication appears in the viewfinder screen when the BACK LIGHT button has been pressed.

   After shooting that particular scene, be sure to press the BACK LIGHT button again to release it to record. Otherwise the recorded picture will be too bright.
   The ▨ indication goes out.

1-11. SHUTTER SPEED ADJUSTMENT

K-1

K-2

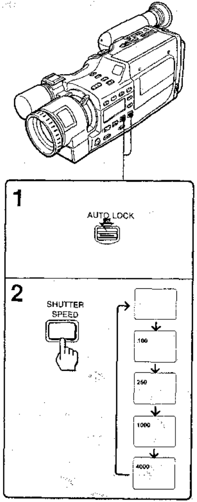
When a fast-moving object is recorded at a normal shutter speed, its still picture may not be seen when played back K-1.

This can be improved by increasing the shutter speed K-2.
The shutter speed of this unit can be selected from five speeds, 1/60 (normal speed), 1/100, 1/250, 1/1000, 1/4000.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.

Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • Recording the skiers	1/4000 or 1/1000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/100

K-3



K-3

1 Set the AUTO LOCK switch down.
The previous shutter speed mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

2 **Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen and display window.**

Each time the SHUTTER SPEED button is pressed, the indication changes:
No indication → 100 → 250 → 1000 → 4000
(1/60) (1/100) (1/250) (1/1000) (1/4000)

Auto focus will not function when shutter speed indication is displayed in the viewfinder.
When shooting, use manual focusing.
When the picture in the viewfinder is dark at the high shutter speed, use the manual focusing.

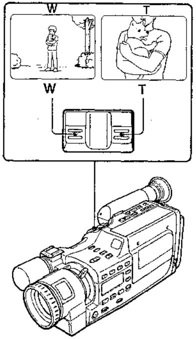
Notes

- When shutter speed 1/250 or more is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
If flickers of fluorescent lamps affect the recording in 50 Hz areas, set the shutter speed to 1/100.
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

1-12. ZOOMING

The size of the subject in the scene can be changed.

L-1

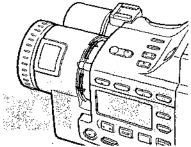


Power Zoom L-1

— for smooth and constant zooming

Press the "T" side of the power zoom button for telephoto and the "W" side for wide-angle.
The zoom lever will move automatically.

L-2



Manual Zoom L-2

— to create a dramatic effect

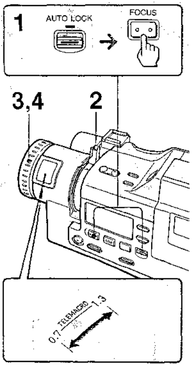
Turn the zoom lever upward for telephoto and downward for wide-angle.

For more zooming effect
The focal length of this unit is 8.5 mm to 68 mm. Converted into the focal length of a 35 mm camera, this means approximately f-43 mm to 340 mm.

1-13. CLOSE-UPS (MACRO)

Even tiny objects can literally fill the screen for dramatic close-up effects.
Remove the lens hood before operation.

M-1



Tele-Macro Shooting M-1

Using this setting, you can record from the video camera recorder within 0.7 to 1.3 meters from the subject.

1 **Set the AUTO LOCK switch down and press the FOCUS button.**

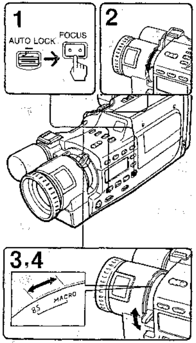
2 **Turn the zoom lever to the telephoto end position (68)**

3 **Turn the focus ring within the TELEMACRO range (1.3 – 0.7)**

4 **Turn the focus ring to bring the subject into sharp focus.**

Note
If you turn the zoom lever from the telephoto end position to wide, the screen may become dark.

M-2



Wide-Macro Shooting M-2

By recording from as close as 1 cm, a dramatic close-up effect can be obtained with a deeper of field compared to the tele-macro picture.

1 **Set the AUTO LOCK switch down and press the FOCUS button to set the manual focusing.**

2 **Turn the zoom lever to the wide-angle position.**

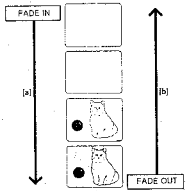
3 **Press the green macro set button turning the zoom lever to the wide-angle position further.**

4 **Turn the zoom lever within the MACRO range in order to focus sharply.**

Notes
- Auto focusing does not function properly in macro shooting.
- When shooting in macro, the depth of field is very shallow, so care must be taken to focus sharply. To keep the subject in focus, use a tripod or monopod to maintain stable picture.
- Zooming is not possible during wide-macro recording. To change the size of the subject, move the camera recorder closer or farther away.

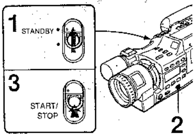
1-14. FADE-IN AND FADE-OUT FUNCTION N-1

N-1



With fade-in, the picture and sound will gradually fade in from a white ground. [a]
With fade-out, the picture and sound will gradually fade out to white. [b]
A natural beginning and ending effects can be added by using fade-in at the beginning of a recording and fade-out at the end of a recording.

N-2



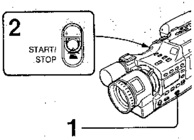
How to Fade-in N-2

1 **Slide the STANDBY switch up to set the unit to the standby mode.**

2 **Press the FADER button.**

3 **Press the START/STOP button.**
Fade-in will be performed and recording will start.

N-3



How to Fade-out N-3

1 **While recording, press the FADER button.**

2 **Press the START/STOP button.**
Fade-out will be performed and then recording will stop.

To cancel the fade-in and fade-out function
Before pressing START/STOP button, press the FADER button again.

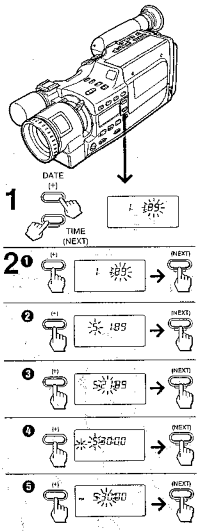
Note
Fade-in or fade-out is cancelled automatically after it has been performed.

1-15. RECORDING DATE OR TIME

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that the power source and lithium battery are installed.
If you install a new lithium battery, re-set date and time again.

O-1



To Set Date and Time O-1

1 **Press the DATE and TIME buttons simultaneously for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode).
The DATE button now functions as the + button and the TIME button functions as the NEXT button.

2 **Adjust the ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.**
First adjust the blinking digits with the + button, and then press the NEXT button.
After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

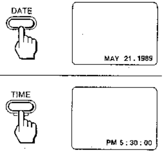
To clear the time indication from the display
Press the TIME (NEXT) button again.

To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes out.

To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

To Record the Date or Time O-2

O-2

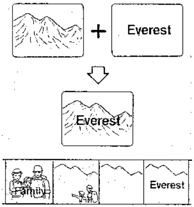


During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

1-16. RECORDING A TITLE (CCD-F70)

P-1



Before recording, memorize a title or figure. The memorized title or figure is superimposed onto the picture being recorded. P-1

- 4 kinds of titles or figures can be memorized.
- The color of the title or figure can be selected from 8 colors.

Make sure that the lithium battery is installed. See page 26.
When you remove the lithium battery, the memorized title will be gone out.

Preparations

To make a desired title card

- Use a white and plane card and draw the title on it with a deep color (black is recommended for the best result) in thick letters.
  If contrast is clear, a signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

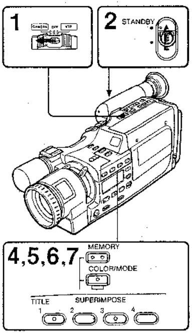
Before memorizing a title

- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button
This button is used to select the title color or title mode.

When the title is displayed	When the title is not displayed
Used as the COLOR button.	Used as the MODE button.
WHT – BLUE – GRN – CYAN (white) (green) BLK – YEL – VIO – RED (black) (yellow) (violet)	No title mode ↑ – ■T – ■T ↑ ↑: title scroll mode ■T: title reverse mode ■T ↑: title reverse and scroll mode
Each push of the COLOR/MODE button cyclically changes the color or mode.	

P-2



To Memorize the Title P-2

1 While pressing the small button, set the POWER switch to CAMERA.

2 Slide up the STANDBY switch to set the unit in the recording pause mode.

3 Point the camera to the title card and adjust the focus.

4 Press the TITLE 1, 2, 3 or 4 button.

5 Press the MEMORY button to memorize the title.

6 Select the title color while observing the color indication in the viewfinder. Each push on the COLOR/MODE button cyclically changes the color (see page 78).

7 Press the TITLE 1, 2, 3 or 4 button (pressed in step 4) to turn off the title.

Notes
- The color indication in the viewfinder is not recorded on the tapes.
- You can change the title color even after starting the recording.

To check the title
To check the memorized title, press the TITLE 1, 2, 3 or 4 button. To turn off the title, press the button again.

To Record the Title

To record the title from the beginning
Press the TITLE 1, 2, 3 or 4 button in recording pause mode, and then start recording.

To record during camera recording
Press the TITLE 1, 2, 3 or 4 button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

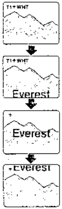
To stop recording the title
Press the TITLE 1, 2, 3 or 4 button again. The picture recording will continue.

To record the same title several times
By repeating the above procedure, you can record the title as many times as desired.

To Scroll the Title from Bottom to Top

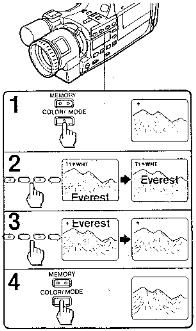
During recording, the memorized title can be scrolled from bottom to top. P-3

P-3



To check the scrolled title P-4

P-4



1 **In the recording pause mode, press the COLOR/MODE button.**
The arrow mark will be displayed.

2 **Press the TITLE 1, 2, 3 or 4 button.**
The title will be displayed from bottom to center.

3 **Press the TITLE 1, 2, 3 or 4 button again.**
The title will be displayed from center to top.

4 **Press the COLOR/MODE button three times.**
The arrow mark will disappear.

To record the scrolled title

1 **In the recording pause mode, press the COLOR/MODE button.**
The arrow mark will be displayed.

2 **Start the camera recording.**

3 **Press the TITLE 1, 2, 3 or 4 button at the point from which the scrolled title is to be recorded.**

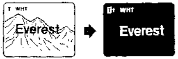
4 **After the title stops at the center of the picture, press the TITLE 1, 2, 3 or 4 button again.**
The title is scrolled from center to top.

To clear the scroll mode
After recording, press the COLOR/MODE button three times.

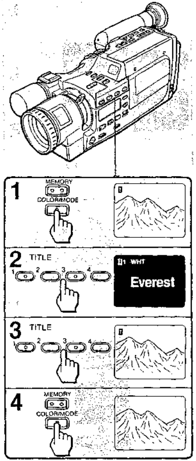
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the title
While the title is being displayed, press the COLOR/MODE button.

P-5



P-6



To Reverse the Title and the Background

The color scheme of the title and the background can be reversed. P-5

To check the reversed picture P-6

1 **In the recording pause mode, press the COLOR/MODE button twice.**
The ■ mark will be displayed.

2 **Press the TITLE 1, 2, 3 or 4 button.**
The reversed title and background will be displayed.

3 **Press the TITLE 1, 2, 3 or 4 button again.**

4 **Press the COLOR/MODE button twice.**
The ■ mark will disappear.

To record the reversed picture from the beginning

1 In the recording pause mode, press the COLOR/MODE button twice.
The T mark will be displayed.

2 Press the TITLE 1, 2, 3 or 4 button.

3 Start the camera recording.

4 Press the TITLE 1, 2, 3 or 4 button again to clear the reversed picture.

To record the reversed picture during recording

1 In the recording pause mode, press the COLOR/MODE button twice.
The T mark will be displayed.

2 Start the camera recording.

3 Press the TITLE 1, 2, 3 or 4 button at the point from which the reversed picture is to be recorded.

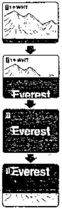
4 Press the TITLE 1, 2, 3 or 4 button again to clear the reversed picture.

To clear the reverse mode
After recording, press the COLOR/MODE button twice.

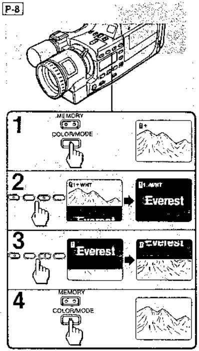
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the background
While the title is being displayed, press the COLOR/MODE button.

P-7



P-8



To Scroll the Reversed Title P-7

To check that the reversed title is scrolled P-8

1 In the recording pause mode, press the COLOR/MODE button three times.
The arrow mark and the T mark will be displayed.

2 Press the TITLE 1, 2, 3 or 4 button.
The reversed picture will be displayed from bottom to center.

3 Press the TITLE 1, 2, 3 or 4 button again.
The title will be displayed from center to top.

4 Press the COLOR/MODE button once.
The marks will disappear.

To record the reversed and scrolled title

1 In the recording pause mode, press the COLOR/MODE button three times.
The arrow mark and the T mark will be displayed.

2 Start the camera recording.

3 Press the TITLE 1, 2, 3 or 4 button at the point from which the reversed and scrolled title is to be recorded.

4 After the reversed title stops at the center of the picture, press the TITLE 1, 2, 3 or 4 button again.
The reversed title is scrolled from center to top.

To clear the reversed scroll mode
After recording, press the COLOR/MODE button once.

If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the background
While the title is being displayed, press the COLOR/MODE button.

1-17. USE OF THE BUILT-IN MIC SWITCH (CCD-F70)

The built-in microphone is a uni-directional microphone which picks up specific sounds from the direction that the microphone is pointed at.

To reduce wind noise during recording

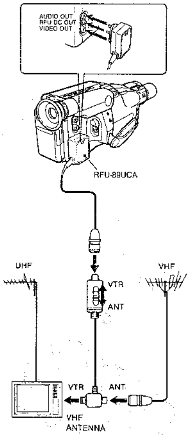
To avoid recording noise caused by strong wind.
Set BUILT-IN MIC switch down.
Normally set to upper position.

A variety of optional microphones.
- Omni-directional microphone: To pick up sounds equally from all directions
- Uni-directional microphone: To pick up specific sounds
- Supercardioid microphone: To isolate a sound
- Zoom microphone: To allow the field of recording to be changed.

Notes
- The built-in microphone will not operate when an optional microphone is connected to the MIC jack.
- When using an optional microphone, the BUILT-IN MIC switch does not work.

1-18. PREPARATION FOR PLAYBACK

R-1



When the VCR is connected to the TV, refer to the pages 104, 106 and 108.

Connecting a TV

Connecting a TV without audio/video input connectors R-1

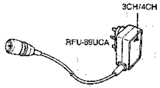
1 **Connect the RFU-89UCA RFU adaptor to the CCD-F70.**

2 **Connect the VHF antenna, CCD-F50/F70 and TV to the antenna selector** (supplied with the RFU-89UCA).
Use a 75-ohm coaxial cable for antenna connection.

3 **Set the selector switch on the antenna selector as follows:**

For viewing a playback picture → VTR
For viewing TV programs → ANT

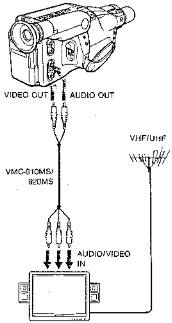
R-2



On the TV channel for the video camera recorder R-2

Whenever you view the playback picture, set the channel selector of the RFU-89UCA to either VHF channel 3 CH or 4 CH which is not active in your area and select the same channel on the TV.

R-3



Connecting a TV (or color monitor) equipped with audio/video input connectors R-3

Leave the TV antenna cable connected to the TV.

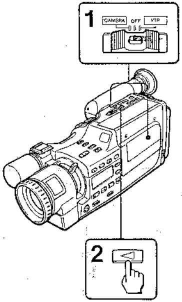
1 Connect the CCD-F50/F70 to the TV using the option VMC-910MS/920MS audio/video cable.

2 **Set the TV/VIDEO selector button on the TV as follows:**

For viewing a playback picture → VIDEO
For viewing TV programs → TV

1-19. PLAYBACK (CCD-F70)

S-1



Turn on the TV (or color monitor), and select the channel for viewing a playback picture (or set the TV/VIDEO selector to VIDEO). S-1

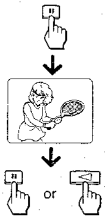
1 **While pressing the small button, set the POWER switch to VTR, and insert a cassette.**

2 **Press the ◁ button.**
Playback will start.

To stop the tape, press the □ button.

After using, be sure to set the POWER switch on the recorder to OFF.

S-2



To view a still picture S-2

Press the II button during playback. To resume playback, press the II button again or the ◁ button.

Monitoring a High-Speed Picture —SKIP SCAN

During playback

1. **In the playback mode, press the ◀◀ or ▶▶ button.**
   The picture will be monitored at high speed as long as it is kept pressed.

2. **Release the ◀◀ or ▶▶ button at the desired point.**
   The picture will be monitored at high speed as long as it is kept pressed.

During fast-forward or rewind

1. **Press the ◀◀ button in fast-forward mode or press the ▶▶ button in rewind mode.**
   The picture is displayed while the button is kept pressed.

2. **Release the ◀◀ or ▶▶ button to resume normal fast-forward or rewind mode.**

(CCD-F70)

To View the Frame-by-Frame Playback Picture

Press the ◀II button during in still pciture mode.
To resume normal playback, press the ◁ button.

(CCD-F70)

To View the Slow Motion Picture

Press the ◀I button during playback or in still picture mode.
To resume normal playback, press the ◁ button.

Notes

- If you move the position of the POWER switch during playback, the tape will stop.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.

To adjust the frame-by-frame and slow playback pictures

In these playback mode, press the "+" or "−" side of the EDITSEARCH button until a clear picture is obtained.
Repeat adjusting until a still picture is displayed clearest.

To adjust the still picture

If the still picture appears to shake, press the "+" or "−" side of the EDITSEARCH button until the picture stabilizes.

Note

The adjustment is retained in memory as long as the lithium battery is installed. Readjustment is only required when the equipment used for playback is changed or when tapes recorded on other equipment are played back on this unit.
The noise may not be eliminated completely when a tape recorded on other equipment is played back in still or slow picture mode.

1-20. TV PROGRAM RECORDING

The following connections make both TV program viewing/recording and tape playback possible.

Combination of the Equipment to be Used

Connection example 1 (page 104)
To connect the VCR without input selector.

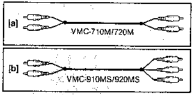
Connection example 2 (page 106)
To connect the VCR with an input selector.

Connection example 3 (page 108)
To connect the TV tuner and color monitor or TV with audio/video input and output jacks

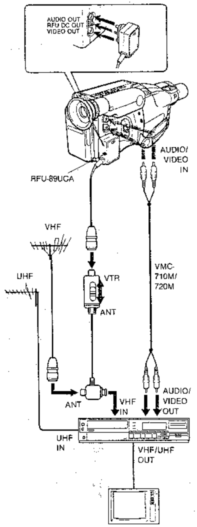
Connecting Cables T-1

- For antenna cable connections, use 75-ohm coaxial cables.
- For video/audio connection, use an optional audio/video cable to match the connectors on the equipment to be connected.
  [a] VMC-710M/720M for monaural equipment
  [b] VMC-910MS/920MS for stereo equipment

T-1



T-2


AUDIO OUT
RFU DC OUT
VIDEO OUT
AUDIO/ VIDEO IN
RFU-89UCA
VHF
UHF
VTR
ANT
VMC-710M/ 720M
ANT
VHF IN
AUDIO/ VIDEO OUT
UHF IN
VHF/UHF OUT

Connection Example 1 T-2

To connect the VCR without input selector

The RFU-89UCA RFU adaptor is required.

Connections

1 Connect the equipment as shown in the illustration.

2 Select the channel selector of the RFU-89UCA to either VHF channel 3 CH or 4 CH which is not active in your area.

3 Set the selector switch on the antenna selector as follows:

For viewing a playback picture or a picture being recorded on the CCD-F50/F70→VTR
For viewing TV programs→ANT

TV program recording

1 Turn on the VCR and TV.

2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Set the selector switch on the antenna selector to ANT and select the channel for the VCR on the TV.

4 Select the TV channel to be recorded on the VCR.

5 Insert a cassette into the CCD-F50/F70 and slide the ● REC switch.
Recording will start.

To view another TV program while recording
Set the TV/VTR select button on the VCR to TV and the selector switch on the antenna selector to ANT. Select the desired program on the TV.

Playback

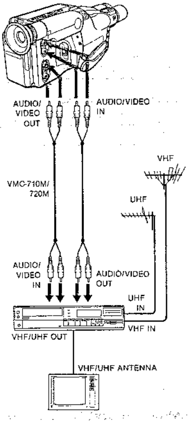
1 Turn on the TV.

2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Set the selector switch on the antenna selector to VTR and select the channel for the VCR on the TV.

4 Insert a cassette into the CCD-F50/F70 and press the ◁ button.
Playback will start.

T-3


AUDIO/ VIDEO OUT
AUDIO/VIDEO IN
VHF
VMC-710M/ 720M
UHF
AUDIO/ VIDEO IN
AUDIO/VIDEO OUT
UHF IN
VHF IN
VHF/UHF OUT
VHF/UHF ANTENNA

Connection Example 2 T-3

Connections
Connect the equipment as shown in the illustration.

TV program recording

1 Turn on the VCR and TV.

2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Select the channel for the VCR on the TV.

4 Set the input selector to TUNER, the TV/VTR select button to VTR and select the TV channel to be recorded on the VCR.

5 Insert a cassette into the CCD-F50/F70 and slide the ● REC switch.
Recording will start.

To view another TV program while recording
Set the TV/VTR select button on the VCR to TV and select the desired program on the TV.

Playback

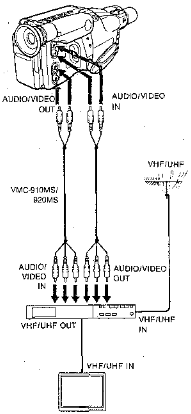
1 Turn on the VCR and TV.

2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Set the input selector on the VCR to LINE and select the channel for the VCR on the TV.

4 Insert a cassette into the CCD-F50/F70 and press the ◁ button.
Playback will start.

T-4


AUDIO/VIDEO OUT
AUDIO/VIDEO IN
VHF/UHF
VMC-910MS/ 920MS
AUDIO/ VIDEO IN
AUDIO/VIDEO OUT
VHF/UHF OUT
VHF/UHF IN
VHF/UHF IN

Connection Example 3 T-4

To connect the TV tuner and color monitor or TV with audio/video input and output jacks

Connections
Connect the equipment as shown in the illustration.

TV program recording

1 Turn on the TV tuner or TV.

2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Set the input selector on the TV tuner or TV to TV and select the TV channel to be recorded.

4 Insert a cassette into the CCD-F50/F70 and slide the ● REC switch.
Recording will start.

Playback

1 Turn on the TV tuner or TV.

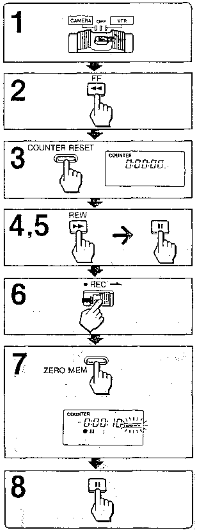
2 While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.

3 Set the input selector on the TV tuner or TV to VIDEO.

4 Insert a cassette into the CCD-F50/F70 and press the ◁ button.
Playback will start.

1-21. INSERT RECORDING 2

U


1
CAMERA
OFF
VTR
2
FF
3
COUNTER RESET
COUNTER
0:00:00
4,5
REW
6
● REC
7
ZERO MEM
COUNTER
-0:00:10
8

To Insert a TV Program or a Picture from Another VCR U

Monitor the picture being inserted on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to VTR.**

2 **Locate the point on the tape where the insert should end by pressing the ◀◀ button during playback.**

3 **Display the counter in the display window and press the COUNTER RESET button.**
The counter is reset to zero.

4 **Press the ▶▶ button during playback to rewind the tape a little further than the point where the insert should begin.**

5 **Release the ▶▶ button to resume playback and press the II button at the insert starting point.**

6 **Slide the ● REC switch in the arrow direction to set the unit to recording pause mode.**

7 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

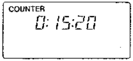
8 **To start recording, press the II button.**

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

1-22. USE OF THE TAPE COUNTER

V-1



During recording or when a tape recorded in the SP mode is played back, the digits on the counter indicate the actual recording or playback time. When a tape recorded in LP mode on another recorder is played back on this unit, the counter counts approximately half the actual playback time.

E.g. When the counter indicates "0:15:20" during playback of an LP-recorded tape, the tape was played back for approximately 30 minutes 40 seconds from the counter zero position. V-1

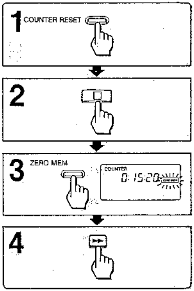
To Index the Whole Tape

Press the COUNTER RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly.
- The counter also operates for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations or after playing back in slow mode for a long time.

V-2



To Return to a Pre-registered Point V-2

1. **During recording or playback, press the COUNTER RESET button at the point you later want to locate.**
2. **Press the □ button when the recording or playback has finished.**
3. **Press the ZERO MEM button.**
   The "ZERO MEM" indicator will blink in the display window and viewfinder.
4. **Press the ►► or ◄◄ button.**
   The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

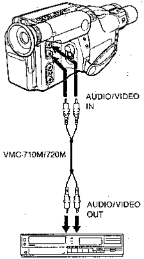
Notes

- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

1-23. TAPE EDITING

To edit a home movie tape, you will need another VCR or another video camera recorder.

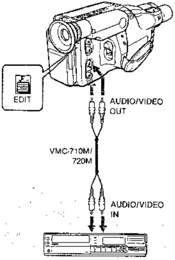
W-1



To Edit from Another VCR to the CCD-F70 W-1

1. While pressing the small button, set the POWER switch on the CCD-F50/F70 to VTR.
2. Press the II button on the VCR during playback at the point where you want to start recording.
3. While pressing the II button, slide the ● REC switch on the CCD-F50/F70 in the arrow direction.
4. Press the II buttons on both units again simultaneously
   Recording will start.

W-2



To Edit from the CCD-F70 to Another VCR W-2

1. While pressing the small button, set the POWER switch on the CCD-F50/F50 to VTR and turn on the other VCR.
2. Slide the EDIT switch on the CCD-F50/F70 to EDIT.
3. Set the input selector on the VCR to LINE.
4. Press the II button on the CCD-F50/F70 during playback at the point where you want to start recording.
5. Press the record button on the other VCR, pressing the II button.
6. Press the II buttons again simultaneously on both units.
   Recording will start.

When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cord.

After editing, turn off both units and be sure to slide the EDIT switch to the upper position.

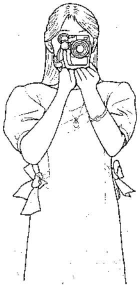
To cut off an unnecessary portion
Press the II button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch down whenever you edit tapes. Signal loss that results from tape-to-tape transfe will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the upper position.

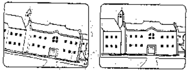
Note
Television programs, films, video tapes and othe materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

1-24. HINTS FOR BETTER SHOOTING

A



B



Basic Camerawork

Getting stable pictures A

For hand-held shots, holding the recorder properly is the key.

- Hold the recorder firmly and secure it with the grip strap so that it is easy to manipulate the recorder with your thumb.
- Breathe gently.
- Place your right elbow firmly against your side.
- Stand opposite to the subject and plant your feet firmly in a comfortable position.
- Place your eye firmly against the viewfinder eyecup.
- Try to keep both eyes open.
- Place your left hand under the camera recorder to support it. When adjusting the focus manually, make sure the unit does not move.
- Do not cover the white balance sensor and infrared beam detector and emitter.

Use a tripod or monopod if possible

If you have a tripod for your still camera, it can also be used with the video camera recorder.
Use a sturdy one.
If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.

Keeping the horizontal plane level

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.

The horizontal plane can be easily determined by using the viewfinder frame as a reference. B

Lighting

Try to shoot scenes with the sun at your back

When shooting a scene when the light source is in back of the subject, the subject will be recorded too dark and the background too light.

The followings are also backlight conditions:

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- A person wearing white or glossy clothes in front of a white background. In this case, the face will be recorded too dark.

For the sharpest pictures, you need the best light

For the most brilliant color in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

What kind of light is best? Choosing the right lights

Photography lamps or halogen lamps are recommended. For best results, use of the Sony video lights are recommended as their weight and low heat output levels allow safe, direct connection to the camera.
For lighting of a wide area for easy use—reflector flood light
To emphasize the subject—use a reflector spotlight.

Precautions for using lights

Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Understanding Light and Color

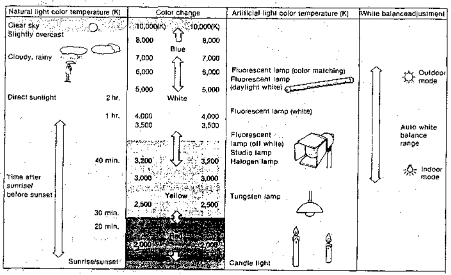
Brightness Levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

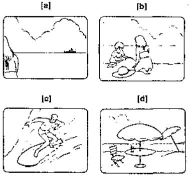
ND filter required	Unit: lux	Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	100,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	10,000	Overcast day, one hour after sunrise (2,000)
	1,000	Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500–700)
	500	Station wicket (650) Office lit by fluorescent lamps (400–500) Room lit by two 30 W fluorescent lamps (300)
	300	Subway station platform (300)
Video light recom-mended		
	100	Arcade at night (150–200)
Video light required		Theater lobby (15–35) Candle light (10–15)
	10	

Color temperature—how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light color." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the color temperature, which in turn stands for "light color." As color temperature increases, the light color changes from red to yellow to white to blue.


Natural light color temperature (K)
Clear sky
Slightly overcast
Cloudy, rainy
Direct sunlight
2 hr.
1 hr.
40 min.
Time after sunrise/ before sunset
30 min.
20 min.
Sunrise/sunset
Color change
10,000(K)
10,000(K)
8,000
8,000
Blue
7,000
7,000
6,000
6,000
5,000
5,000
White
4,000
4,000
3,500
3,500
3,200
3,200
3,000
3,000
Yellow
2,500
2,500
Red
2,000
2,000
Artificial light color temperature (K)
Fluorescent lamp (color matching)
Fluorescent lamp (daylight white)
Fluorescent lamp (white)
Fluorescent lamp (off white)
Studio lamp
Halogen lamp
Tungsten lamp
Candle light
White balanceadjustment
Outdoor mode
Auto white balance range
Indoor mode

C



For More Effective Production

Scene length — not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6~7 seconds in length for easier viewing.
A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

Cut the scene when the narration is finished.

Cutting according to the subject C

- Make long shots longer **[a]**...and close-ups shorter **[b]**.
  Because long shots have more to see in them than colse-ups, show them longer so the viewer may understand what's there.
- Make interesting shots and shots in which the subject is constantly moving longer. **[c]**
- Make static shots shorter **[d]**

Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

In video, organization is the key

To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events that happen around you, such as sports matches, graduations, birthday parties, picnics, camping trips, and other special events.

When the tape is edited after recording
Shoot the scene a little longer to make the editing easier.
When the tape is not edited after recording
First record a title and then use the START/STOP function to make a smooth recording.

1-25. USE OF THE BATTERY PACK

There are two kinds of batteries, non-rechargeable ones (primary batteries) such as manganese, alkaline or lithium batteries, and rechargeable ones (secondary batteries) such as nickel-cadmium or lead batteries.
The NP-77/55 battery pack used for this unit is a rechargeable type. When a rechargeable battery is used under proper conditions, the power capacity remains stable for a long period.

Battery Life

For every hour's worth of tape you shoot, plan to use 2 to 3 hour's worth of battery power.

The NP-77 provides approximately 80 minutes operation.
The NP-55 provides approximately 40 minutes operation.

The above battery life shows when the fully-charged battery is used for continuous recording in the normal temperature.
The following cases cause the battery to wear.

- In the recording pause mode (standby)
- When the auto focusing operates
- When the power zooming operates
- When the cassette is inserted or removed

Ambient temperature

If the battery pack is used in a cold environment, its operating time is shortened.

- A chemical change occurs inside the battery when generating electrical energy. When the ambient temperature is high, the chemical change is stronger and the battery life is extended.
- Manganese and alkaline batteries are affected more than nickel-cadmium batteries by ambient temperature.
  Therefore the EBP-55 battery case cannot be used in a cold environment.

Charging and Discharging

To use the battery pack for a long time, charge the battery pack fully and discharge it.

Charging

- The battery pack can be charged within a temperature range of 0°C to 40°C (32°F to 104°F). However, it is hard to charge the battery pack in a cold place. We recommend undertaking charging operations within a temperature range of 10°C to 30°C (50°F to 86°F).
- The battery pack was not charged at the factory. So before using the battery pack, please charge it.
- Before using the battery which has not been used for a long time (about 1 year), charge the battery fully.
  In this case the battery life is shortened.
  After several charging and discharging operations, the battery life will recover its original status.
- The battery pack may be warm after use or after charging, but this is normal. This is due to the chemical change that has occurred inside the battery.

Discharging

- After using the recorder, remove the cassette and set the POWER switch to CAMERA and slide up the STANDBY switch, and leave the recorder until the battery pack is fully discharged.
- If recharging is repeated before the battery pack is exhausted, the battery life will be shortened.
  If the battery life has been shortened due to this, charge and discharge it to recover the original battery capacity.
- Please use the battery pack until the 🔋 mark blinks.
- To discharge the battery pack as completely as possible, use an optional video light.
  If the video light becomes dark, remove the video light from the video camera recorder.

Storage

- When the video camera recorder is not in use, discharge the battery pack completely, remove and store it in a cold place. When the battery pack is installed, even if the power is turned off, a very small amount of electric current flows.
- Even when the battery pack is not in use, it discharges. This is called self-discharge.
  Self-discharge of the nickel-cadmium battery is more than that of the manganese or alkaline battery.
  The capacity decreases about 20 % in one month and 30 % in two months.
  After the battery is stored in a hot place, the capacity is lowered due to self-discharge.

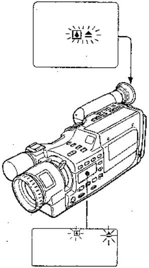
Battery life

The battery pack can be used about 500 times in normal temperature, if it is charged fully and discharged and stored in a cold place when not in use.

The battery pack can be used until the capacity becomes less than 50 % and cannot be recharged.
Even when a fully charged battery is used, if the 🔋 mark blinks, use a new battery pack.

1-26. NOTE ON MOISTURE CONDENSATION

U-1



If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit; on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: U-1

The ▣ and ⏏ indication blinks inside the viewfinder or in the display window.
No function except for cassette ejection will work.

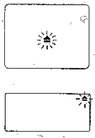
⬇

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

⬇

The unit can be used again if the ▣ and ⏏ indication does not appear when the power is turned on again.

U-2



If moisture is present on the surface of the tape U-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indication blinks inside the viewfinder or in the display window. No function except for cassette ejection will work.

⬇

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indication does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indications, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

1-27. PRECAUTIONS

Operation

- Operate the unit on 6.0V (battery pack)/ 7.5V (AC power adaptor)/9.0V DC (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light sources) as this will damage the color filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  —Locations susceptible to vibration.
  —Locations exposed to strong magnetic fields.
  —Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- For protection, keep the lens cap on the lens when not using the camera.

1-28. USING YOUR RECORDER ABROAD

Each country has special TV color broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in color systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V-240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the NTSC system and have the video/audio inputs.

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

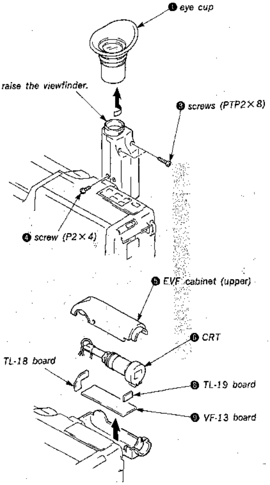
SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, the Soviet Union, etc.

Differences in cassette tapes
There are two kinds of cassette tapes, due to the video systems, "E6–" or "P6–" for the NTSC color system, and "P5–" for the PAL color system. They differ in tape speed (recording/ playback time). When a "P5–" tape is used in countries of the NTSC system, the tape speed is as follows:

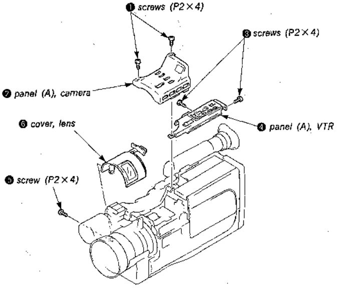
Cassette tape	Tape speed	
	SP	LP (playback only)
P5-15	22 min.	44 min.
P5-30	43 min.	86 min.
P5-60	84 min.	168 min.
P5-90	126 min.	252 min.

SECTION 2
DISASSEMBLY

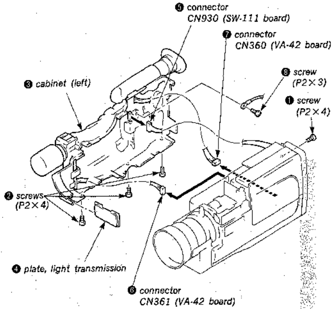
2-1. REMOVAL OF VIEWFINDER


❶ eye cup
❷ raise the viewfinder.
❸ screws (PTP2×8)
❹ screw (P2×4)
❺ EVF cabinet (upper)
❻ CRT
❼ TL-18 board
❽ TL-19 board
❾ VF-13 board

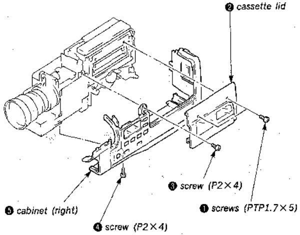
2-2. REMOVAL OF CABINET (1)


❶ screws (P2×4)
❸ screws (P2×4)
❷ panel (A), camera
❹ panel (A), VTR
❻ cover, lens
❺ screw (P2×4)

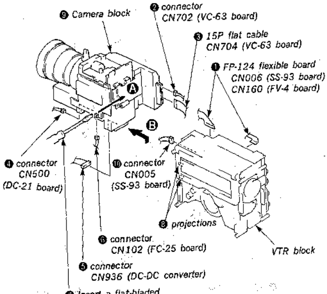
2-3. REMOVAL OF CABINET (2)
— CABINET (LEFT) —


❺ connector
CN930 (SW-111 board)
❼ connector
CN360 (VA-42 board)
❽ screw
(P2×3)
❶ screw
(P2×4)
❸ cabinet (left)
❷ screws
(P2×4)
❹ plate, light transmission
❻ connector
CN361 (VA-42 board)

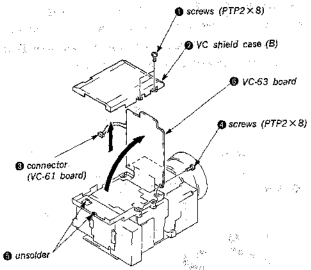
2-4. REMOVAL OF CABINET (3)
— CABINET (RIGHT) —


❷ cassette lid
❸ screw (P2×4)
❺ cabinet (right)
❶ screws (PTP1.7×5)
❹ screw (P2×4)

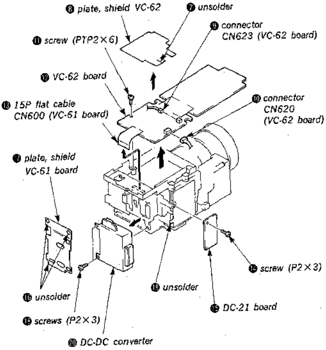
2-5. SEPARATING THE CAMERA AND VTR BLOCKS

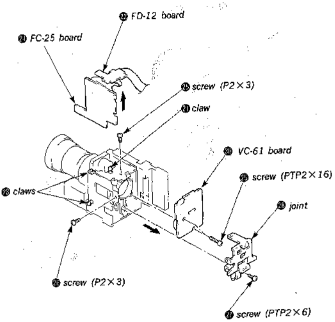

⑨ Camera block
② connector
CN702 (VC-63 board)
③ 15P flat cable
CN704 (VC-63 board)
① FP-124 flexible board
CN006 (SS-93 board)
CN160 (FV-4 board)
A
B
④ connector
CN500
(DC-21 board)
⑩ connector
CN005
(SS-93 board)
⑧ projections
⑥ connector
CN102 (FC-25 board)
VTR block
⑤ connector
CN936 (DC-DC converter)

⑦ Insert a flat-bladed screwdriver between the camera block and VTR block (as shown by arrow Ⓐ) to separate two projections. Then slightly lift and remove the camera block ⑨ in the direction shown by the arrow Ⓑ.


① screws (PTP2×8)
② VC shield case (B)
⑥ VC-63 board
④ screws (PTP2×8)
③ connector
(VC-61 board)
⑤ unsolder

2-6. REMOVAL OF VC-61 (CCD IMAGER), VC-62 AND VC-63 BOARDS

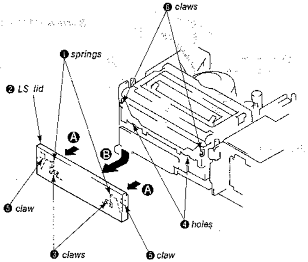

⑧ plate, shield VC-62
⑦ unsolder
⑨ connector
CN623 (VC-62 board)
⑪ screw (PTP2×6)
⑫ VC-62 board
⑩ connector
CN620
(VC-62 board)
⑬ 15P flat cable
CN600 (VC-61 board)
⑰ plate, shield
VC-61 board
⑭ screw (P2×3)
⑯ unsolder
⑲ unsolder
⑮ DC-21 board
⑱ screws (P2×3)
⑳ DC-DC converter


㉒ FD-12 board
㉑ FC-25 board
㉓ screw (P2×3)
㉔ claw
㉚ VC-61 board
㉙ screw (PTP2×16)
㉖ claws
㉘ joint
㉕ screw (P2×3)
㉗ screw (PTP2×6)

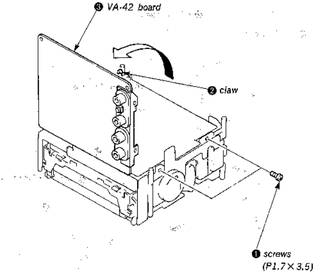
2-7. REMOVAL OF LS LID

1) Insert a thin flat-bladed screwdriver into the spring ❶ at 2 points and push it in the direction of arrow Ⓐ, and then remove the LS lid ❷ in the direction of arrow Ⓑ.

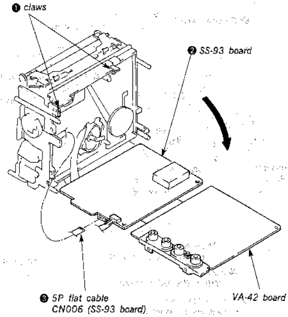
Note : To re-assemble, locate the two claws ❸ at the back of each hole ❹ at 2 points, and also the two claws ❺ at the back of each claw ❻ at 2 locations.


❻ claws
❶ springs
❷ LS lid
Ⓐ
Ⓑ
Ⓐ
❺ claw
❹ holes
❸ claws
❺ claw

2-8. OPENING THE VA-42 BOARD

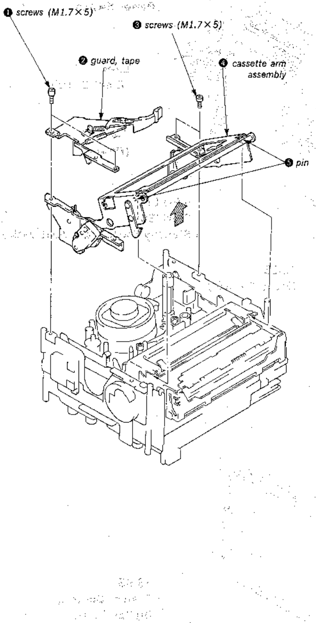

❸ VA-42 board
❷ claw
❶ screws
(P1.7 × 3.5)

2-9. OPENING THE SS-93 BOARD

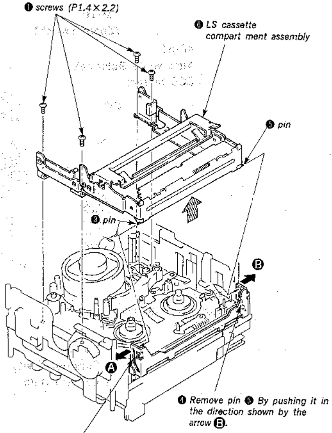

❶ claws
❷ SS-93 board
❸ 5P flat cable
CN006 (SS-93 board)
VA-42 board

2-10. REMOVAL OF CASSETTE ARM

Note :
To re- assembly the cassette arm assembly ④, adjust it so that pin ⑤ can be inserted in the correct position.


① screws (M1.7×5)
③ screws (M1.7×5)
② guard, tape
④ cassette arm assembly
⑤ pin

2-12. REMOVAL OF LS CASSETTE COMPARTMENT ASSEMBLY

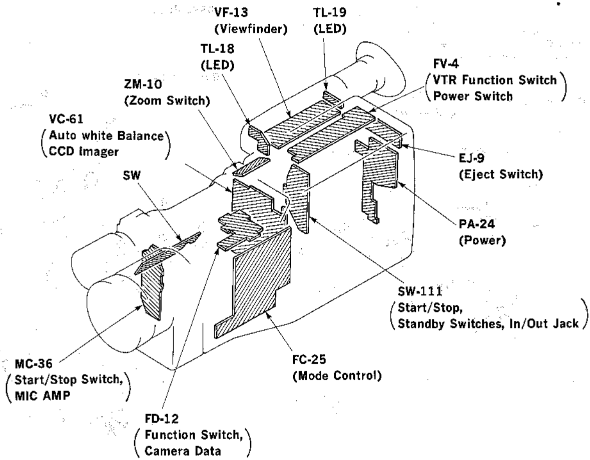

① screws (P1.4×2.2)
⑥ LS cassette compart ment assembly
⑤ pin
③ pin
Ⓑ
Ⓐ

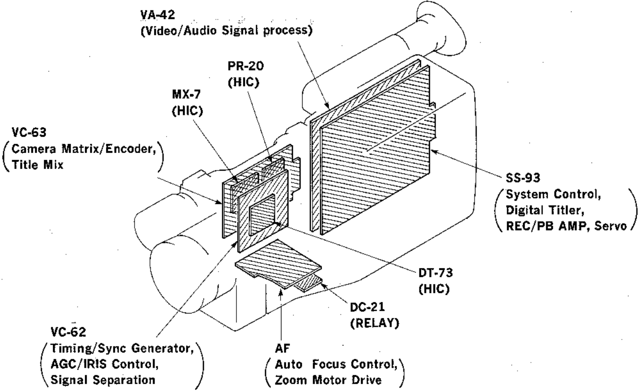
④ Remove pin ⑤ By pushing it in the direction shown by the arrow Ⓑ.

② Remove pin ③ in the direction shown by the arrow Ⓐ.

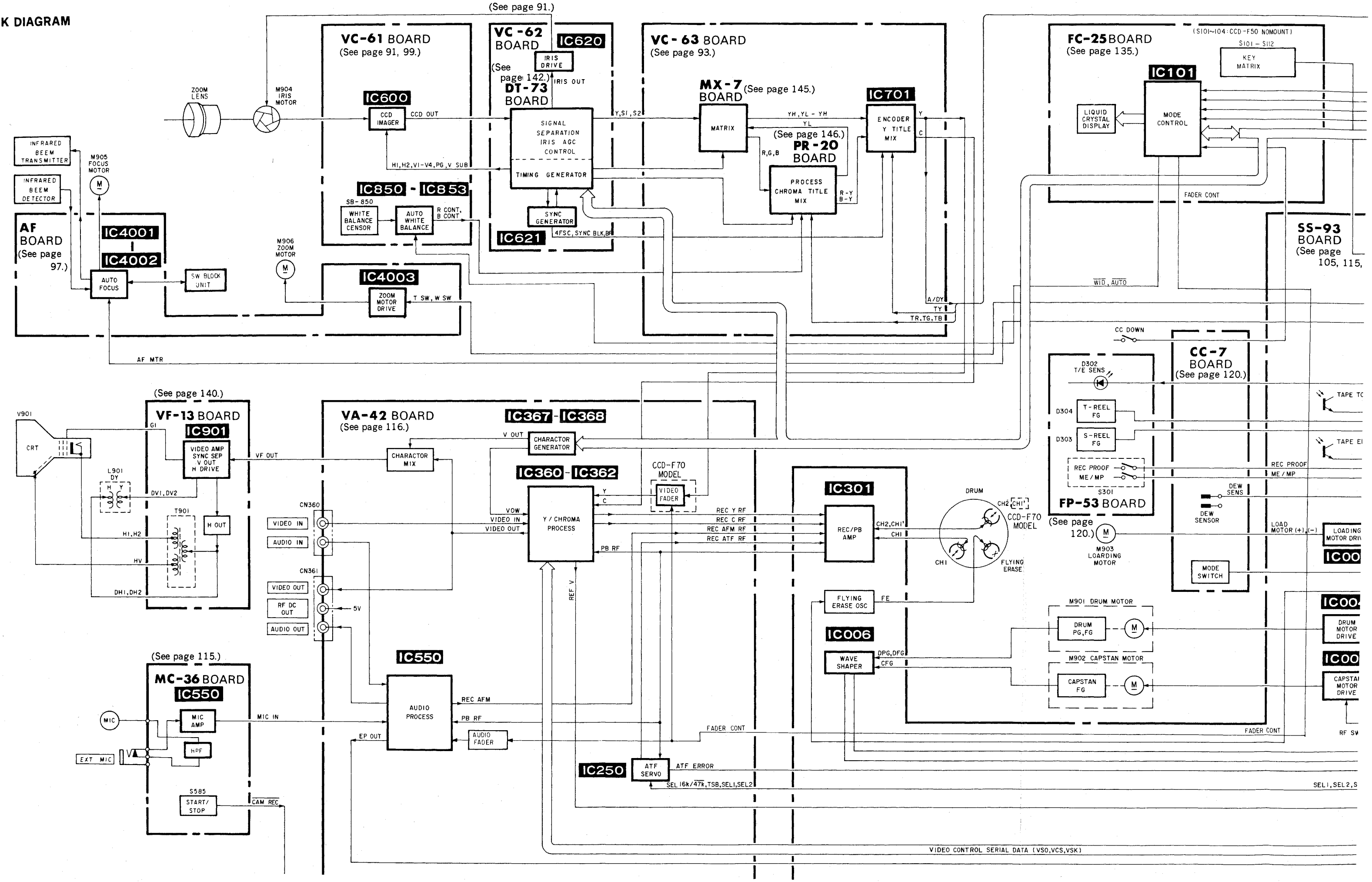
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

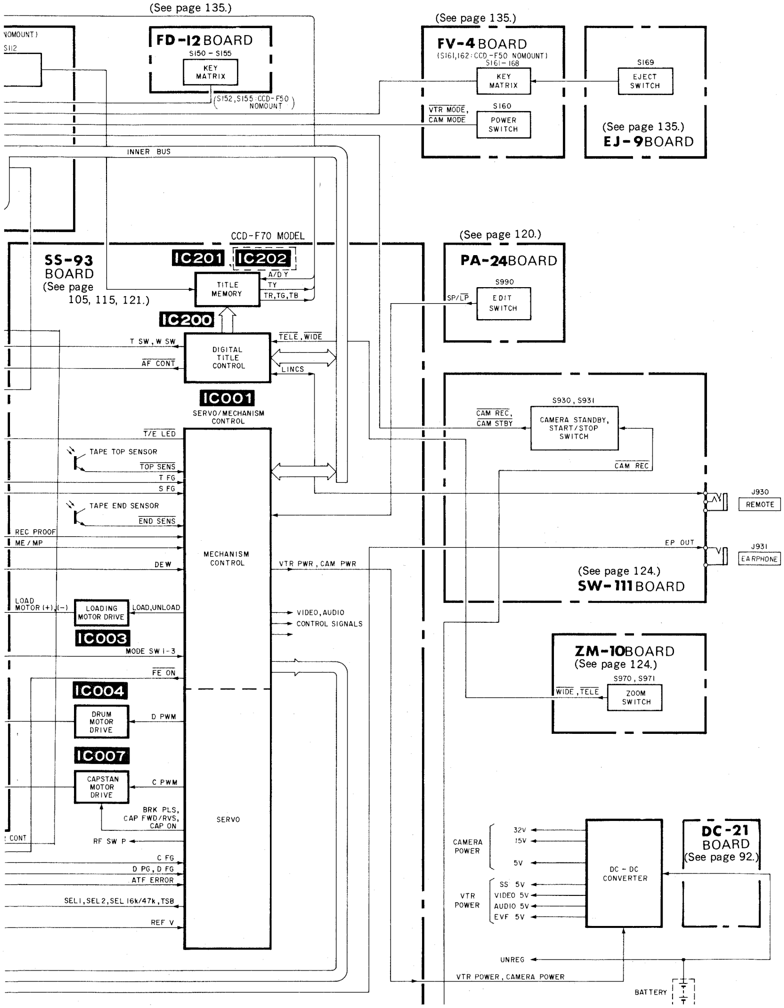

VF-13
(Viewfinder)
TL-19
(LED)
TL-18
(LED)
FV-4
(VTR Function Switch
Power Switch)
ZM-10
(Zoom Switch)
VC-61
(Auto white Balance
CCD Imager)
EJ-9
(Eject Switch)
SW
PA-24
(Power)
SW-111
(Start/Stop,
Standby Switches, In/Out Jack)
MC-36
(Start/Stop Switch,
MIC AMP)
FC-25
(Mode Control)
FD-12
(Function Switch,
Camera Data)

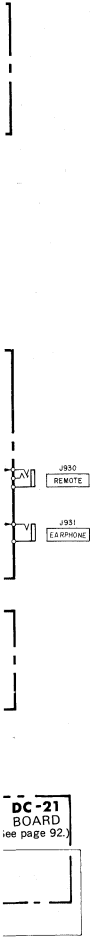

VA-42
(Video/Audio Signal process)
PR-20
(HIC)
MX-7
(HIC)
VC-63
(Camera Matrix/Encoder,
Title Mix)
SS-93
(System Control,
Digital Titler,
REC/PB AMP, Servo)
DT-73
(HIC)
DC-21
(RELAY)
VC-62
(Timing/Sync Generator,
AGC/IRIS Control,
Signal Separation)
AF
(Auto Focus Control,
Zoom Motor Drive)

K DIAGRAM

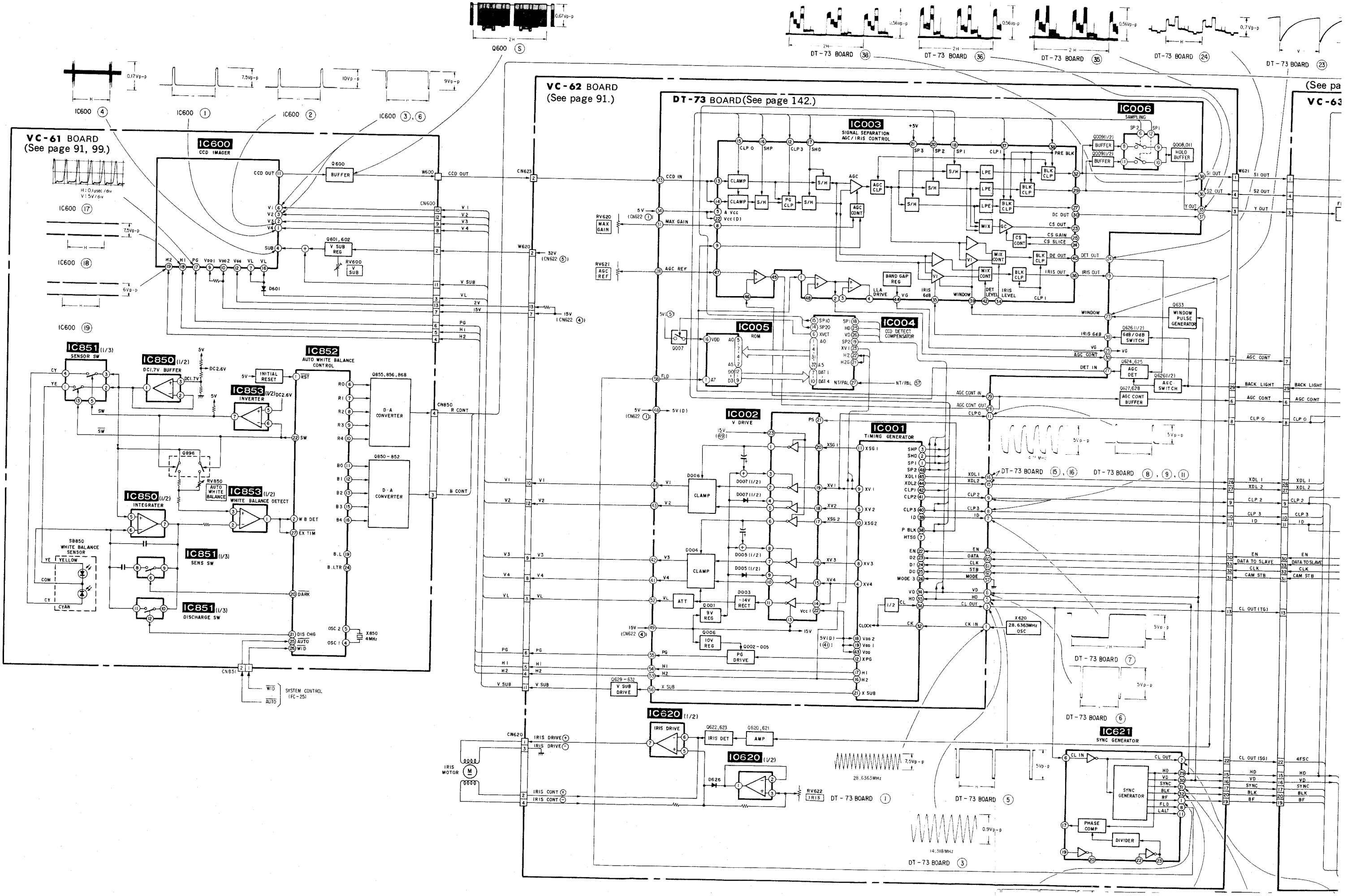


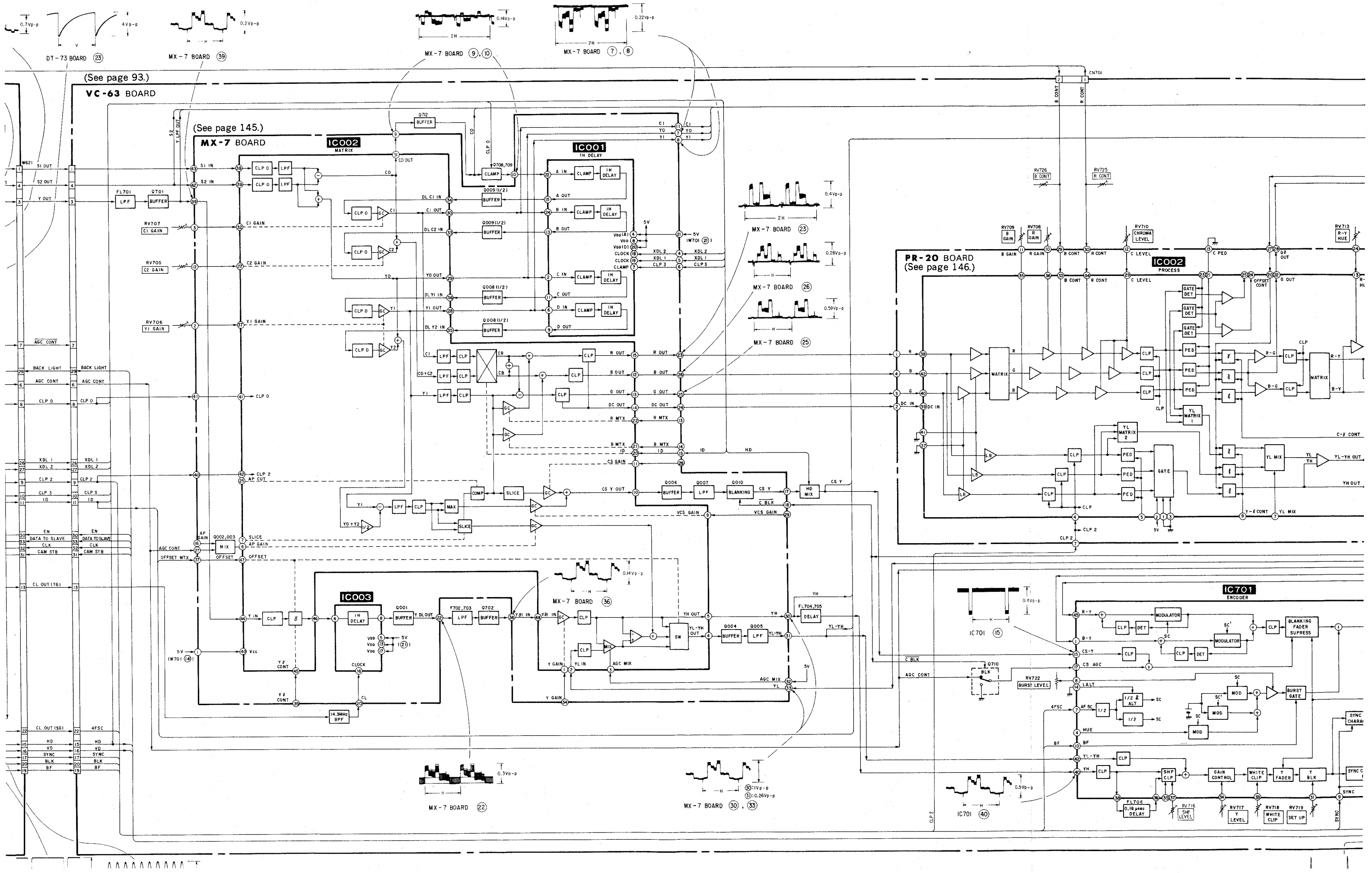
(See page 91.)
VC-61 BOARD
(See page 91, 99.)
VC-62 BOARD
(See page 142.)
DT-73 BOARD
IC620
IRIS DRIVE
IRIS OUT
VC-63 BOARD
(See page 93.)
MX-7 BOARD
(See page 145.)
(See page 146.)
PR-20 BOARD
IC701
ENCODER Y TITLE MIX
MATRIX
PROCESS CHROMA TITLE MIX
YH, YL - YH
YL
R, G, B
R-Y
B-Y
Y, SI, S2
ZOOM LENS
M904 IRIS MOTOR
IC600
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
H1, H2, V1-V4, PG, V SUB
IC850 - IC853
SB-850
WHITE BALANCE CENSOR
AUTO WHITE BALANCE
R CONT, B CONT
SYNC GENERATOR
IC621
4FSC, SYNC BLK, BF
INFRARED BEEM TRANSMITTER
INFRARED BEEM DETECTOR
M905 FOCUS MOTOR
AF BOARD
(See page 97.)
IC4001
IC4002
AUTO FOCUS
SW BLOCK UNIT
M906 ZOOM MOTOR
IC4003
ZOOM MOTOR DRIVE
T SW, W SW
AF MTR
FC-25 BOARD
(See page 135.)
(S101~104: CCD-F50 NOMOUNT)
S101 - S112
KEY MATRIX
IC101
MODE CONTROL
LIQUID CRYSTAL DISPLAY
FADER CONT
SS-93 BOARD
(See page 105, 115,
WID, AUTO
A/DY
TY
TR, TG, TB
CC DOWN
CC-7 BOARD
(See page 120.)
D302 T/E SENS
D304
T-REEL FG
D303
S-REEL FG
REC PROOF
ME/MP
S301
FP-53 BOARD
(See page 120.)
M903 LOARDING MOTOR
DEW SENS
DEW SENSOR
LOAD MOTOR (+), (-)
LOADING MOTOR DRIV
IC00
MODE SWITCH
TAPE TO
TAPE EI
REC PROOF
ME/MP
(See page 140.)
VF-13 BOARD
IC901
VIDEO AMP SYNC SEP V OUT H DRIVE
V901
CRT
G1
L901 DY
DV1, DV2
T901
H OUT
H1, H2
HV
DH1, DH2
VF OUT
VA-42 BOARD
(See page 116.)
IC367 - IC368
V OUT
CHARACTOR GENERATOR
CHARACTOR MIX
IC360 - IC362
Y/CHROMA PROCESS
VOW
VIDEO IN
VIDEO OUT
CCD-F70 MODEL
VIDEO FADER
Y
C
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
PB RF
REF V
CN360
VIDEO IN
AUDIO IN
CN361
VIDEO OUT
RF DC OUT
AUDIO OUT
5V
IC301
REC/PB AMP
CH2, CH1'
CH1
DRUM
CH2 (CH1')
CCD-F70 MODEL
CH1
FLYING ERASE
FLYING ERASE OSC
FE
IC006
WAVE SHAPER
DPG, DFG
CFG
M901 DRUM MOTOR
DRUM PG, FG
M902 CAPSTAN MOTOR
CAPSTAN FG
IC00
DRUM MOTOR DRIVE
IC00
CAPSTAN MOTOR DRIVE
RF SW
FADER CONT
(See page 115.)
MC-36 BOARD
IC550
MIC
MIC AMP
HPF
EXT MIC
MIC IN
S585
START/STOP
CAM REC
IC550
AUDIO PROCESS
REC AFM
PB RF
EP OUT
AUDIO FADER
FADER CONT
IC250
ATF SERVO
ATF ERROR
SEL 16k/47k, TSB, SEL1, SEL2
SEL1, SEL2, S
VIDEO CONTROL SERIAL DATA (VSO, VCS, VSK)


(See page 135.)
FD-12 BOARD
S150 - S155
KEY MATRIX
(S152, S155 : CCD-F50 NOMOUNT)
(See page 135.)
FV-4 BOARD
(S161, 162 : CCD-F50 NOMOUNT)
S161 - 168
KEY MATRIX
S160
POWER SWITCH
VTR MODE,
CAM MODE
S169
EJECT SWITCH
(See page 135.)
EJ-9 BOARD
NOMOUNT)
S112
INNER BUS
SS-93 BOARD
(See page 105, 115, 121.)
CCD-F70 MODEL
IC201
IC202
TITLE MEMORY
A/D Y
TY
TR, TG, TB
IC200
DIGITAL TITLE CONTROL
T SW, W SW
AF CONT
TELE, WIDE
LINCS
IC001
SERVO/MECHANISM CONTROL
T/E LED
TAPE TOP SENSOR
TOP SENS
T FG
S FG
TAPE END SENSOR
END SENS
REC PROOF
ME / MP
DEW
MECHANISM CONTROL
VTR PWR, CAM PWR
LOAD MOTOR (+), (−)
LOADING MOTOR DRIVE
LOAD, UNLOAD
IC003
VIDEO, AUDIO
CONTROL SIGNALS
MODE SW 1-3
FE ON
IC004
DRUM MOTOR DRIVE
D PWM
IC007
CAPSTAN MOTOR DRIVE
C PWM
BRK PLS, CAP FWD/RVS, CAP ON
CONT
RF SW P
SERVO
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2, SEL 16k/47k, TSB
REF V
(See page 120.)
PA-24 BOARD
S990
EDIT SWITCH
SP/LP
S930, S931
CAMERA STANDBY, START/STOP SWITCH
CAM REC,
CAM STBY
CAM REC
J930
REMOTE
EP OUT
J931
EARPHONE
(See page 124.)
SW-111 BOARD
ZM-10 BOARD
(See page 124.)
S970, S971
ZOOM SWITCH
WIDE, TELE
CAMERA POWER
32V
15V
5V
VTR POWER
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
DC - DC CONVERTER
DC-21 BOARD
(See page 92.)
UNREG
VTR POWER, CAMERA POWER
BATTERY

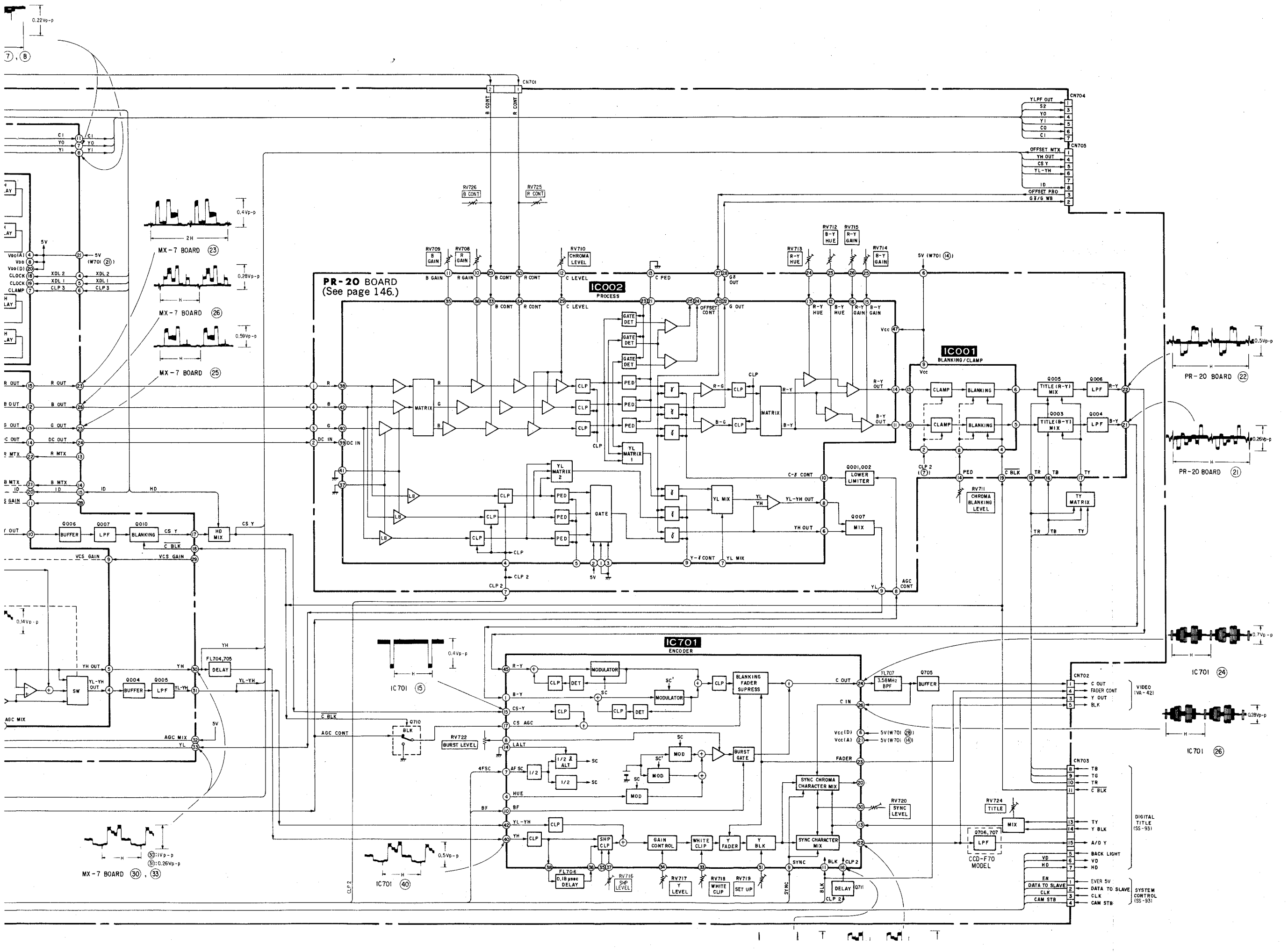

J930
REMOTE
J931
EARPHONE
DC-21
BOARD
ee page 92.)

RAM

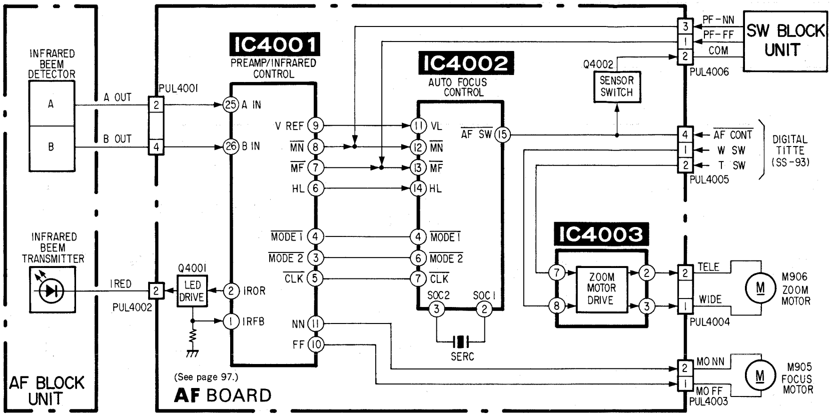

VC-61 BOARD (See page 91, 99.)
VC-62 BOARD (See page 91.)
DT-73 BOARD (See page 142.)
(See pa
VC-63
IC600 CCD IMAGER
Q600 BUFFER
Q601, 602 V SUB REG
RV600 V SUB
D601
IC600 ④
IC600 ①
IC600 ②
IC600 ③, ⑥
IC600 ⑰
IC600 ⑱
IC600 ⑲
Q600 Ⓢ
0.17Vp-p
7.5Vp-p
10Vp-p
9Vp-p
6Vp-p
0.67Vp-p
H: 0.1μsec/div
V: 5V/div
IC851 (1/3) SENSOR SW
IC850 (1/2) DC1.7V BUFFER
IC853 (1/2) INVERTER
IC852 AUTO WHITE BALANCE CONTROL
INITIAL RESET
D-A CONVERTER
Q855, 856, 868
Q850-852
Q896
RV850 AUTO WHITE BALANCE
IC850 (1/2) INTEGRATER
IC853 (1/2) WHITE BALANCE DETECT
SB850 WHITE BALANCE SENSOR
YELLOW
CYAN
IC851 (1/3) SENS SW
IC851 (1/3) DISCHARGE SW
X850 4MHz
CN851
SYSTEM CONTROL (FC-25)
WID
AUTO
R CONT
B CONT
CCD OUT
V SUB
CN600
CN623
CN620
CN850
W600
W620
W621
32V (CN622 ⑤)
15V (CN622 ④)
IC003 SIGNAL SEPARATION AGC/IRIS CONTROL
IC006 SAMPLING
Q009 (1/2) BUFFER
Q008, 011 HOLD BUFFER
RV620 MAX GAIN
RV621 AGC REF
IC005 ROM
IC004 CCD DETECT COMPENSATOR
Q007
Q633 WINDOW PULSE GENERATOR
Q626 (1/2) 6dB/0dB SWITCH
Q624, 625 AGC DET
Q626 (1/2) AGC SWITCH
Q627, 628 AGC CONT BUFFER
IC002 V DRIVE
IC001 TIMING GENERATOR
D006 CLAMP
D004 CLAMP
ATT
Q001 9V REG
Q006 10V REG
Q002-005 PG DRIVE
Q629-632 V SUB DRIVE
X620 28.6363MHz OSC
IC620 (1/2) IRIS DRIVE
Q622, 623 IRIS DET
Q620, 621 AMP
IC620 (1/2)
D626
RV622 IRIS
IRIS MOTOR
IC621 SYNC GENERATOR
PHASE COMP
DIVIDER
SYNC GENERATOR
S1 OUT
S2 OUT
Y OUT
AGC CONT
BACK LIGHT
CLP 0
XDL 1
XDL 2
CLP 2
CLP 3
ID
EN
DATA TO SLAVE
CLK
CAM STB
CL OUT (TG)
CL OUT (SG)
4FSC
HD
VD
SYNC
BLK
BF
DT-73 BOARD ㊳
DT-73 BOARD ㊱
DT-73 BOARD ㉟
DT-73 BOARD ㉔
DT-73 BOARD ㉓
DT-73 BOARD ⑮, ⑯
DT-73 BOARD ⑧, ⑨, ⑪
DT-73 BOARD ⑦
DT-73 BOARD ⑥
DT-73 BOARD ①
DT-73 BOARD ⑤
DT-73 BOARD ③
0.56Vp-p
0.7Vp-p
5Vp-p
7.5Vp-p
0.9Vp-p
28.6363MHz
14.318MHz



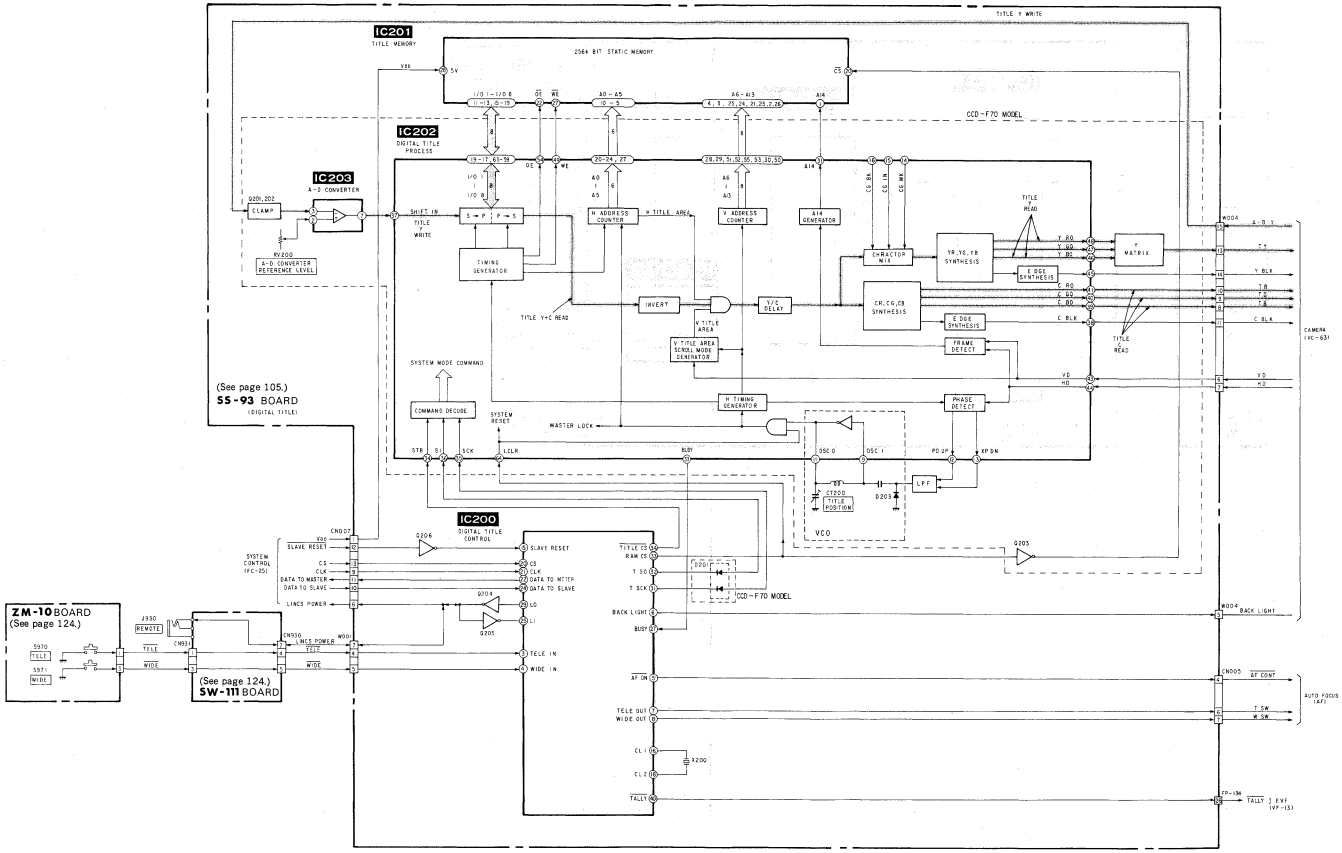
DT-73 BOARD ㉓
0.7Vp-p
4Vp-p
V
MX-7 BOARD ㊴
0.2Vp-p
H
MX-7 BOARD ⑨,⑩
0.14Vp-p
2H
MX-7 BOARD ⑦,⑧
0.22Vp-p
2H
(See page 93.)
VC-63 BOARD
CN701
B CONT
R CONT
(See page 145.)
MX-7 BOARD
IC002
MATRIX
IC001
1H DELAY
IC003
W621
S1 OUT
S2 OUT
Y OUT
FL701
LPF
Q701
BUFFER
S2
Y LPF OUT
S1 IN
S2 IN
RV707
C1 GAIN
RV705
C2 GAIN
RV706
Y1 GAIN
CLP O
LPF
Q712
BUFFER
CO
CO OUT
CLP O
Q708,709
CLAMP
Q009 (1/2)
BUFFER
Q008 (1/2)
DL C1 IN
C1 OUT
DL C2 IN
Y0 OUT
DL Y1 IN
Y1 OUT
DL Y2 IN
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
1H DELAY
C1
Y0
Y1
5V
(W701 ㉑)
VDD(A)
VDD
VDD(D)
CLOCK
CLAMP
XDL 2
XDL 1
CLP 3
CR
CB
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
CS GAIN
CLP 2
AP CUT
COMP
SLICE
MAX
GC
Y0+Y2
1/2
CS Y OUT
Q006
BUFFER
Q007
LPF
Q010
BLANKING
CS Y
C BLK
HD MIX
VCS GAIN
AGC CONT
BACK LIGHT
AGC CONT
CLP O
XDL 1
XDL 2
CLP 2
CLP 3
ID
EN
DATA TO SLAVE
CLK
CAM STB
AP GAIN
Q002,003
MIX
SLICE
AP GAIN
OFFSET MTX
OFFSET
CL OUT (TG)
Y IN
CLP
γ
1H DELAY
Q001
BUFFER
Y DL OUT
F702,703
LPF
Q702
BUFFER
Yδ1 IN
YH OUT
YL-YH OUT
SW
Q004
BUFFER
Q005
LPF
YL-YH
YH
FL704,705
DELAY
Y GAIN
YL IN
AGC MIX
YL
VDD
CLOCK
Yγ CONT
CL
14.3MHz BPF
5V (W701 ⑭)
Vcc
MX-7 BOARD ㊱
0.14Vp-p
MX-7 BOARD ㉓
0.4Vp-p
MX-7 BOARD ㉖
0.28Vp-p
MX-7 BOARD ㉕
0.59Vp-p
MX-7 BOARD ㉒
0.3Vp-p
MX-7 BOARD ㉚, ㉛
㉚:1Vp-p
㉛:0.26Vp-p
CL OUT (SG)
4FSC
HD
VD
SYNC
BLK
BF
PR-20 BOARD
(See page 146.)
IC002
PROCESS
RV709 B GAIN
RV708 R GAIN
RV726 B CONT
RV725 R CONT
RV710 CHROMA LEVEL
RV713 R-Y HUE
B GAIN
R GAIN
B CONT
R CONT
C LEVEL
C PED
Gδ OUT
OFFSET CONT
G OUT
GATE DET
MATRIX
PED
YL MATRIX 1
YL MATRIX 2
GATE
YL MIX
YL-YH OUT
YH OUT
C-γ CONT
Y-γ CONT
R-G
B-G
R-Y
B-Y
DC IN
LB
CLP 2
5V
IC701
ENCODER
IC701 ⑮
0.4Vp-p
IC701 ㊵
0.5Vp-p
Q710
BLK
RV722
BURST LEVEL
MODULATOR
BLANKING FADER SUPRESS
CS-Y
CS AGC
LALT
AF SC
1/2
1/2 & ALT
MOD
BURST GATE
HUE
SC
YL-YH
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
FL706
0.18μsec DELAY
RV716 SHP LEVEL
RV717 Y LEVEL
RV718 WHITE CLIP
RV719 SET UP
SYNC
SYNC CHARA


PR-20 BOARD
(See page 146.)
IC002
PROCESS
IC001
BLANKING/CLAMP
IC701
ENCODER
CN701
B CONT
R CONT
CN704
YLPF OUT
S2
Y0
Y1
C0
C1
CN705
OFFSET MTX
YH OUT
CS Y
YL-YH
ID
OFFSET PRO
Gγ/G WB
RV726
B CONT
RV725
R CONT
RV709
B GAIN
RV708
R GAIN
RV710
CHROMA LEVEL
RV713
R-Y HUE
RV712
B-Y HUE
RV715
R-Y GAIN
RV714
B-Y GAIN
5V (W701 ⑭)
MATRIX
CLP
PED
GATE DET
YL MATRIX 1
YL MATRIX 2
YL MIX
GATE
LB
C-γ CONT
Q001,002
LOWER LIMITER
YL-YH OUT
YH OUT
Q007
MIX
Y-γ CONT
CLP 2
AGC CONT
CLAMP
BLANKING
Q005
TITLE (R-Y) MIX
Q003
TITLE (B-Y) MIX
Q006
Q004
LPF
TY MATRIX
RV711
CHROMA BLANKING LEVEL
C BLK
TR
TB
TY
PR-20 BOARD ㉒
0.5Vp-p
PR-20 BOARD ㉑
0.26Vp-p
MX-7 BOARD ㉓
0.4Vp-p
2H
MX-7 BOARD ㉖
0.28Vp-p
MX-7 BOARD ㉕
0.59Vp-p
0.22Vp-p
⑦, ⑧
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
HD
Q006
BUFFER
Q007
LPF
Q010
BLANKING
CS Y
C BLK
HD MIX
VCS GAIN
5V (W701 ㉑)
XDL 2
XDL 1
CLP 3
CLAMP
CLOCK
VDD(A)
VDD
VDD(D)
YH OUT
SW
YL-YH OUT
Q004
BUFFER
Q005
LPF
YH
FL704,705
DELAY
YL-YH
AGC MIX
YL
0.14Vp-p
MX-7 BOARD ㉚, ㉝
㉚:1Vp-p
㉝:0.26Vp-p
IC701 ⑮
0.4Vp-p
IC701 ㊵
0.5Vp-p
R-Y
B-Y
CS-Y
CS AGC
LALT
AF SC
HUE
BF
YL-YH
YH
MODULATOR
DET
SC
1/2
1/2 & ALT
MOD
BURST GATE
Q710
BLK
RV722
BURST LEVEL
4FSC
BLANKING FADER SUPRESS
C OUT
C IN
FL707
3.58MHz BPF
Q705
BUFFER
Vcc(D)
Vcc(A)
5V(W701 ㉘)
5V(W701 ⑭)
FADER
SYNC CHROMA CHARACTER MIX
RV720
SYNC LEVEL
SYNC CHARACTER MIX
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
FL706
0.18μsec DELAY
RV716
SHP LEVEL
RV717
Y LEVEL
RV718
WHITE CLIP
RV719
SET UP
SYNC
BLK
CLP 2
DELAY
Q711
RV724
TITLE
MIX
Q706,707
LPF
CCD-F70 MODEL
CN702
C OUT
FADER CONT
Y OUT
BLK
VIDEO (VA-421)
CN703
TB
TG
TR
C BLK
TY
Y BLK
A/D Y
BACK LIGHT
VD
HD
DIGITAL TITLE (SS-931)
EN
DATA TO SLAVE
CLK
CAM STB
EVER 5V
SYSTEM CONTROL (SS-931)
IC701 ㉔
0.7Vp-p
IC701 ㉖
0.28Vp-p

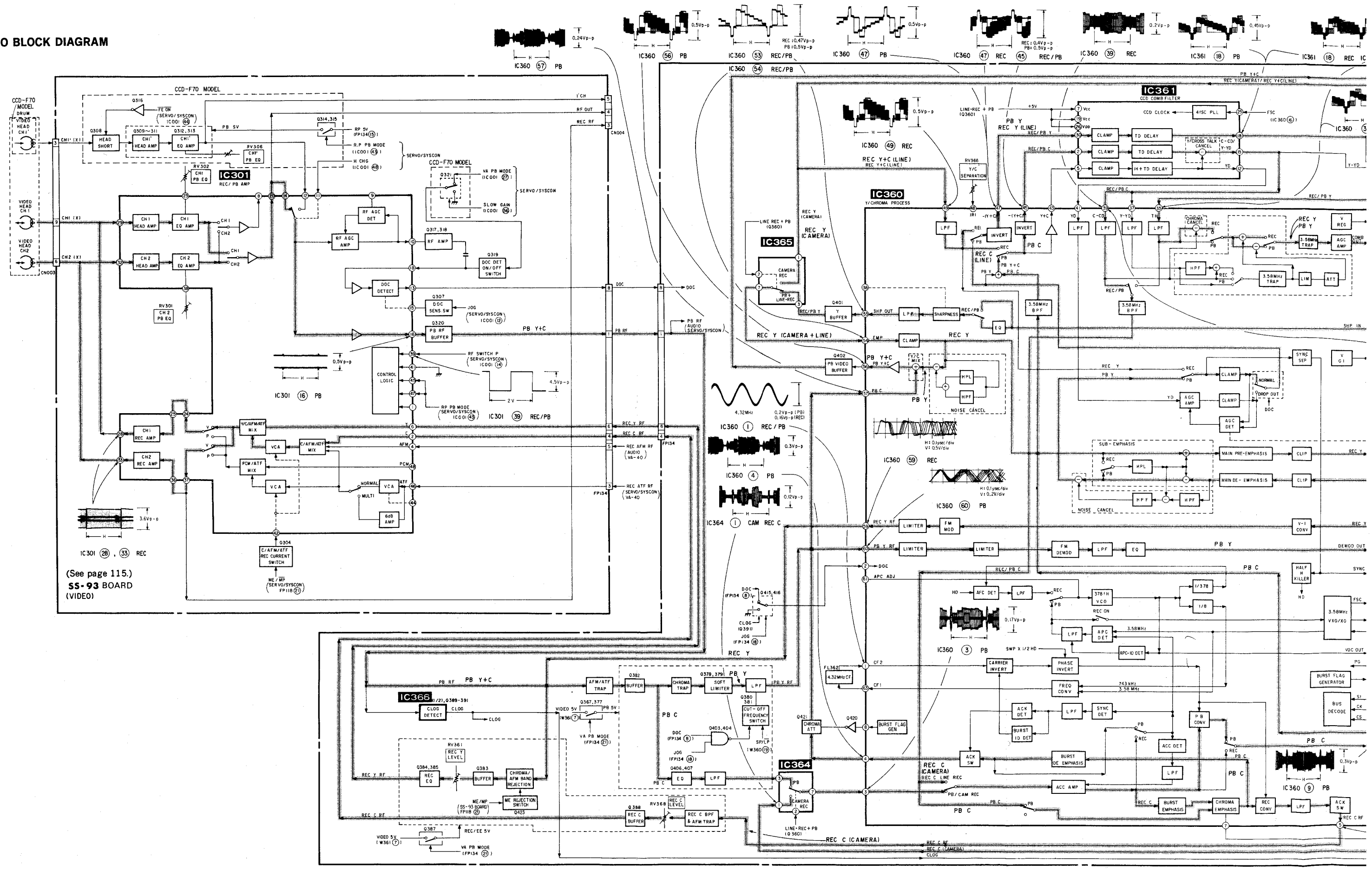
3-4. AUTO FOCUS BLOCK DIAGRAM


INFRARED BEEM DETECTOR
A
B
A OUT
B OUT
PUL4001
2
4
INFRARED BEEM TRANSMITTER
IRED
PUL4002
Q4001
LED DRIVE
AF BLOCK UNIT
IC4001
PREAMP/INFRARED CONTROL
25 A IN
26 B IN
2 IROR
1 IRFB
V REF 9
MN 8
MF 7
HL 6
MODE 1 4
MODE 2 3
CLK 5
NN 11
FF 10
(See page 97.)
AF BOARD
IC4002
AUTO FOCUS CONTROL
11 VL
12 MN
13 MF
14 HL
AF SW 15
4 MODE 1
6 MODE 2
7 CLK
SOC2 3
SOC1 2
SERC
Q4002
SENSOR SWITCH
IC4003
ZOOM MOTOR DRIVE
7
8
2
3
PF-NN
PF-FF
COM
SW BLOCK UNIT
PUL4006
AF CONT
W SW
T SW
DIGITAL TITTE (SS-93)
PUL4005
TELE
WIDE
PUL4004
M906 ZOOM MOTOR
M
MO NN
MO FF
PUL4003
M905 FOCUS MOTOR

3-5. DIGITAL TITLER BLOCK DIAGRAM

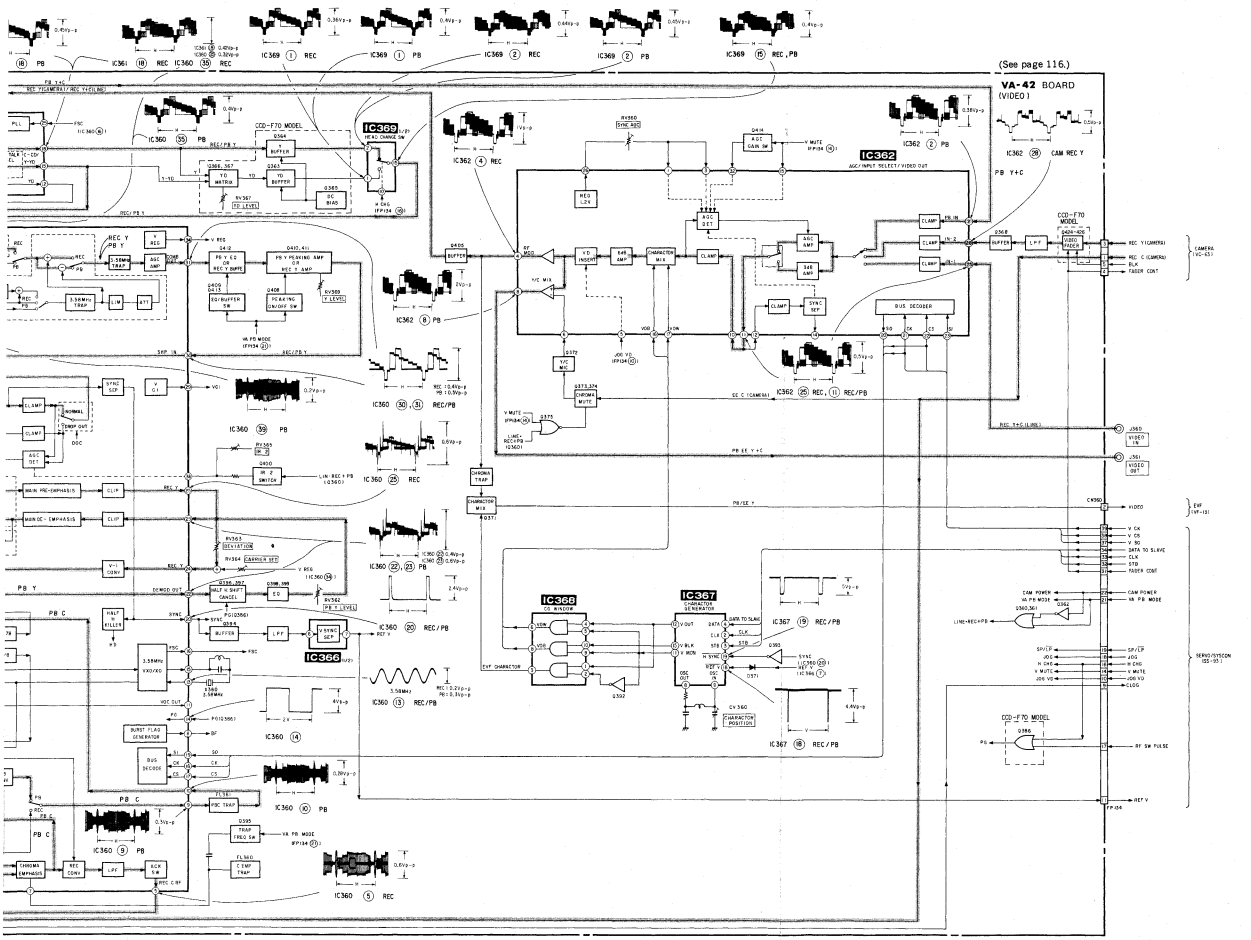

IC201
TITLE MEMORY
256k BIT STATIC MEMORY
VDD
5V
CS
I/O 1 - I/O 8
11-13, 15-19
OE
WE
A0 - A5
10 - 5
A6 - A13
4, 3, 25, 24, 21, 23, 2, 26
A14
TITLE Y WRITE
CCD-F70 MODEL
IC202
DIGITAL TITLE PROCESS
19-17, 63-59
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
I/O 1
I/O 8
A0
A5
A6
A13
IC203
A-D CONVERTER
Q201, 202
CLAMP
RV200
A-D CONVERTER REFERENCE LEVEL
SHIFT IN
TITLE Y WRITE
S→P
P→S
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
CG BK
CG IN
CG MK
TITLE Y READ
CHRACTOR MIX
YR, YG, YB SYNTHESIS
Y RO
Y GO
Y BO
EDGE SYNTHESIS
Y MATRIX
CR, CG, CB SYNTHESIS
C RO
C GO
C BO
C BLK
TITLE C READ
INVERT
Y/C DELAY
TITLE Y+C READ
V TITLE AREA
V TITLE AREA SCROLL MODE GENERATOR
FRAME DETECT
VD
HD
PHASE DETECT
H TIMING GENERATOR
SYSTEM MODE COMMAND
COMMAND DECODE
SYSTEM RESET
MASTER LOCK
STB
SI
SCK
LCLR
BUSY
OSC O
OSC I
PD UP
XP DN
LPF
CT200
TITLE POSITION
D203
VCO
W004
A-D Y
T Y
Y BLK
T R
T G
T B
C BLK
CAMERA (VC-63)
VD
HD
(See page 105.)
SS-93 BOARD
(DIGITAL TITLE)
CN007
SYSTEM CONTROL (FC-25)
VDD
SLAVE RESET
CS
CLK
DATA TO MASTER
DATA TO SLAVE
LINCS POWER
IC200
DIGITAL TITLE CONTROL
Q206
SLAVE RESET
CS
CLK
DATA TO MSTER
DATA TO SLAVE
Q204
LO
LI
Q205
TELE IN
WIDE IN
TITLE CS
RAM CS
T SO
T SCK
D201
CCD-F70 MODEL
BACK LIGHT
BUSY
Q203
W004
BACK LIGHT
AF ON
CN005
AF CONT
AUTO FOCUS (AF)
TELE OUT
WIDE OUT
T SW
W SW
CL1
CL2
X200
TALLY
FP-134
TALLY
EVF (VF-13)
ZM-10 BOARD
(See page 124.)
S970
TELE
S971
WIDE
J930
REMOTE
CN931
CN930
W001
LINCS POWER
TELE
WIDE
(See page 124.)
SW-111 BOARD

3-6. VIDEO BLOCK DIAGRAM

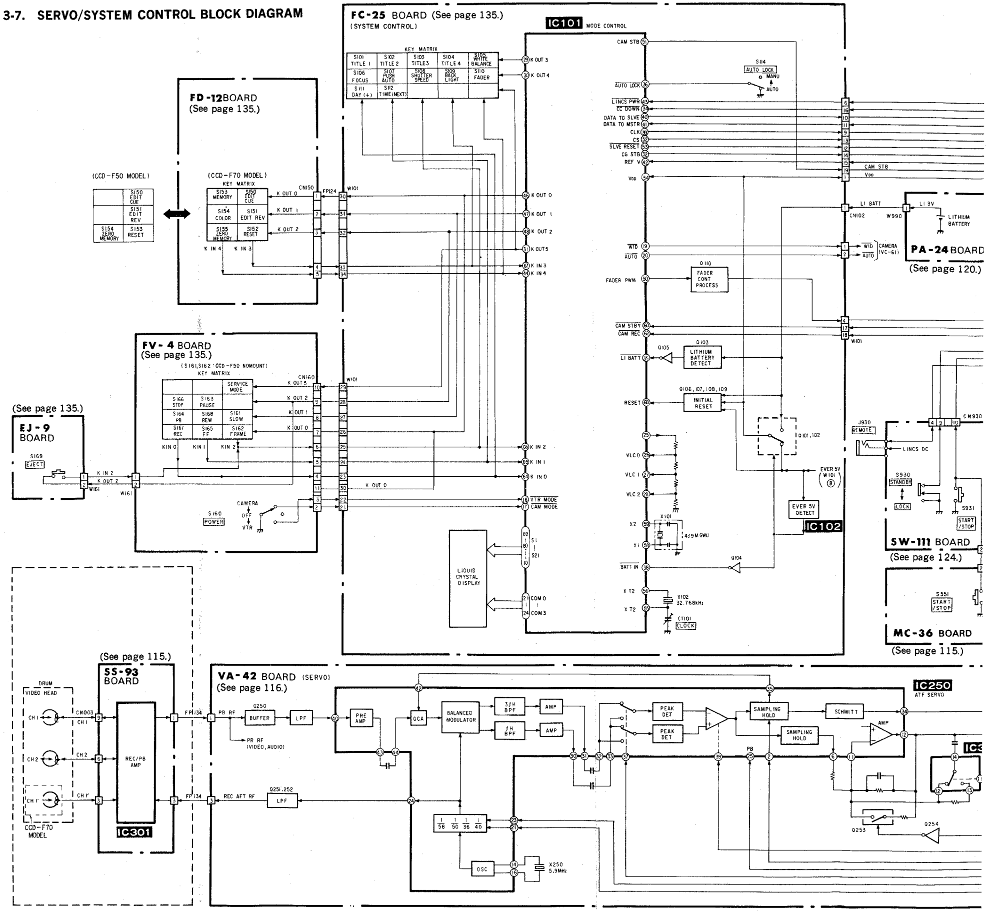

IC301 REC/PB AMP
IC360 Y/CHROMA PROCESS
IC361 CCD COMB FILTER
IC364
IC365
IC366
CCD-F70 MODEL
VIDEO HEAD CH1
VIDEO HEAD CH2
HEAD SHORT
CH1' HEAD AMP
CH1' EQ AMP
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
RF AGC DET
RF AGC AMP
RF AMP
DOC DETECT
DOC SENS. SW
DOC DET ON/OFF SWITCH
PB RF BUFFER
CONTROL LOGIC
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
6dB AMP
C/AFM/ATF REC CURRENT SWITCH
SERVO/SYSCON
PB Y+C
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
DOC
CN003
CN004
FP134
AFM/ATF TRAP
BUFFER
CHROMA TRAP
SOFT LIMITER
LPF
CUT-OFF FREQUENCY SWITCH
EQ
REC EQ
CHROMA/AFM BAND REJECTION
ME REJECTION SWITCH
REC C BUFFER
REC C BPF & AFM TRAP
CLOG DETECT
Y/C SEPARATION
SHARPNESS
CLAMP
TD DELAY
1H+TD DELAY
4fsc PLL
CCD CLOCK
Y/CROSS TALK CANCEL
INVERT
3.58MHz BPF
3.58MHz TRAP
LIMITER
FM MOD
FM DEMOD
NOISE CANCEL
SUB-EMPHASIS
MAIN PRE-EMPHASIS
MAIN DE-EMPHASIS
CLIP
AGC AMP
AGC DET
DROP OUT
SYNC SEP
AFC DET
378fH VCO
APC DET
APC-ID DET
CARRIER INVERT
PHASE INVERT
FREQ CONV
ACK DET
BURST ID DET
SYNC DET
BURST FLAG GEN
ACK SW
BURST DE EMPHASIS
ACC AMP
ACC DET
BURST EMPHASIS
CHROMA EMPHASIS
REC CONV
PB CONV
CHROMA ATT
HALF H KILLER
3.58MHz VXO/XO
BURST FLAG GENERATOR
BUS DECODE
REC Y (CAMERA + LINE)
REC C (CAMERA)
PB Y
PB C
CLOG

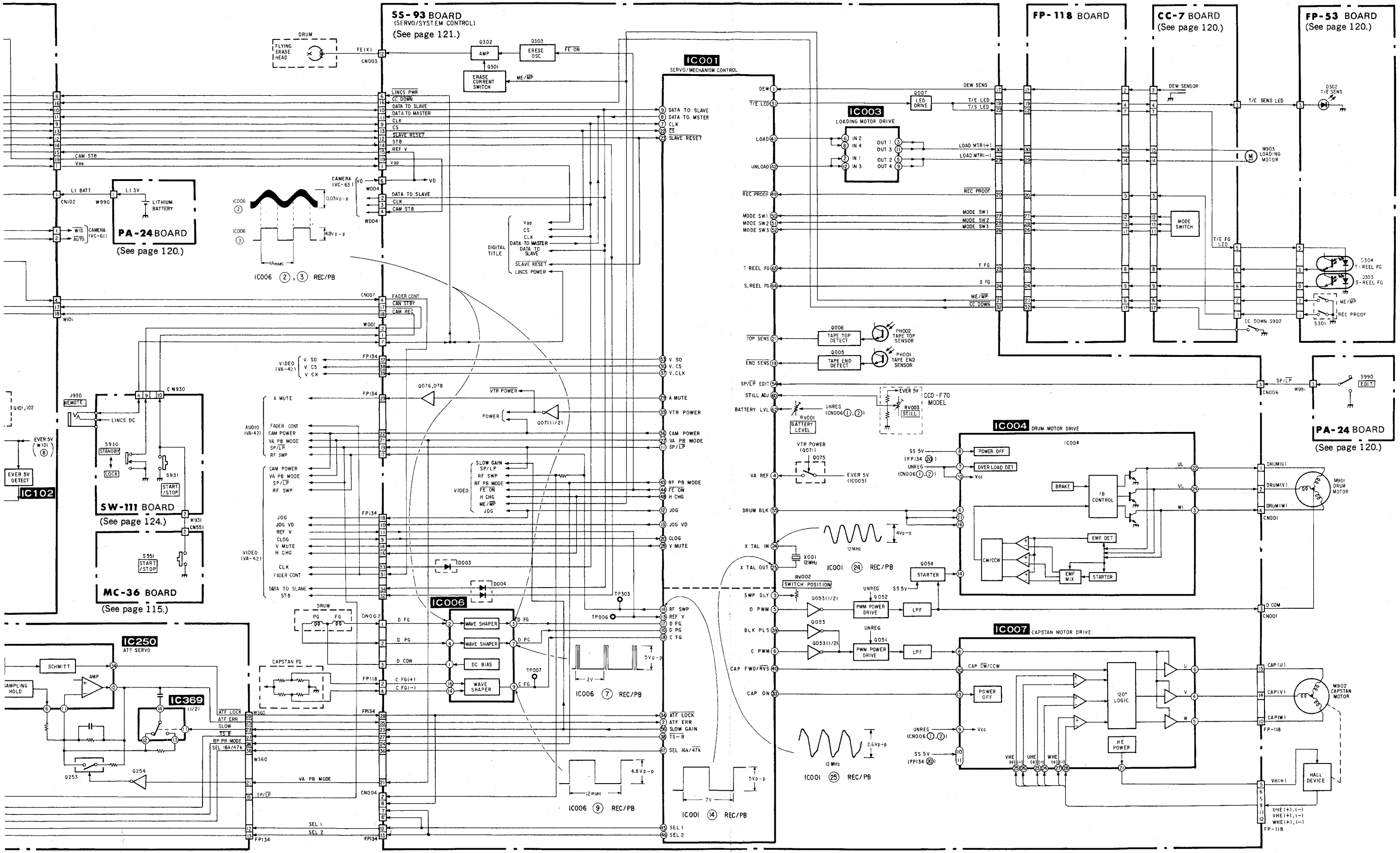
(See page 115.)
SS-93 BOARD
(VIDEO)

(See page 116.)


VA-42 BOARD
(VIDEO)
IC369 HEAD CHANGE SW
IC362 AGC/INPUT SELECT/VIDEO OUT
IC368 CG WINDOW
IC367 CHARACTOR GENERATOR
IC366 V SYNC SEP
CCD-F70 MODEL
IC360 (35) PB
IC362 (4) REC
IC362 (2) PB
IC362 (28) CAM REC Y
IC362 (8) PB
IC362 (25) REC, (11) REC/PB
IC360 (30), (31) REC/PB
IC360 (39) PB
IC360 (25) REC
IC360 (22), (23) PB
IC360 (20) REC/PB
IC360 (13) REC/PB
IC360 (14)
IC360 (10) PB
IC360 (9) PB
IC360 (5) REC
IC367 (19) REC/PB
IC367 (18) REC/PB
IC369 (1) REC
IC369 (1) PB
IC369 (2) REC
IC369 (2) PB
IC369 (15) REC, PB
IC361 (18) REC
IC360 (35) REC
J360 VIDEO IN
J361 VIDEO OUT
CAMERA (VC-63)
EVF (VF-13)
SERVO/SYSCON (SS-93)
FP134
CN360
RV360 SYNC AGC
RV367 YD LEVEL
RV369 Y LEVEL
RV363 DEVIATION
RV364 CARRIER SET
RV362 PB Y LEVEL
RV365 IR 2
CV360 CHARACTOR POSITION
X360 3.58MHz
FL361 PBC TRAP
FL360 C EMP TRAP

3-7. SERVO/SYSTEM CONTROL BLOCK DIAGRAM


FC-25 BOARD (See page 135.)
(SYSTEM CONTROL)
IC101 MODE CONTROL
KEY MATRIX
S101 TITLE 1
S102 TITLE 2
S103 TITLE3
S104 TITLE 4
S105 WHITE BALANCE
S106 FOCUS
S107 PUSH AUTO
S108 SHUTTER SPEED
S109 BACK LIGHT
S110 FADER
S111 DAY (+)
S112 TIME(NEXT)
K OUT 3
K OUT 4
CAM STB
AUTO LOCK
LINCS PWR
CC DOWN
DATA TO SLVE
DATA TO MSTR
CLK
CS
SLVE RESET
CG STB
REF V
VDD
S114 AUTO LOCK
MANU
AUTO
CAM STB
VDD
LI BATT
CN102
W990
LI 3V
LITHIUM BATTERY
PA-24 BOARD
(See page 120.)
WID
AUTO
CAMERA (VC-61)
K OUT 0
K OUT 1
K OUT 2
K OUT5
K IN 3
K IN 4
Q110 FADER CONT PROCESS
FADER PWM
CAM STBY
CAM REC
W101
Q105
Q103 LITHIUM BATTERY DETECT
Q106, 107, 108, 109 INITIAL RESET
RESET
Q101, 102
EVER 5V (W101 ⑧)
EVER 5V DETECT
IC102
VLC0
VLC 1
VLC 2
X2
X1
X101 4.19MHz
BATT IN
Q104
X T2
X102 32.768kHz
CT101 CLOCK
K IN 2
K IN 1
K IN 0
VTR MODE
CAM MODE
S1
S21
COM 0
COM 3
LIQUID CRYSTAL DISPLAY
FD-12 BOARD (See page 135.)
(CCD-F50 MODEL)
(CCD-F70 MODEL)
KEY MATRIX
S150 EDIT CUE
S151 EDIT REV
S154 ZERO MEMORY
S153 RESET
S153 MEMORY
S154 COLOR
S155 ZERO MEMORY
S152 RESET
CN150
FP124
K IN 4
K IN 3
FV-4 BOARD (See page 135.)
(S161, S162 : CCD-F50 NOMOUNT)
KEY MATRIX
SERVICE MODE
S166 STOP
S163 PAUSE
S164 PB
S168 REW
S161 SLOW
S167 REC
S165 FF
S162 FRAME
CN160
K OUT 5
K IN 0
K IN 1
K IN 2
S160 POWER
CAMERA
OFF
VTR
W161
(See page 135.)
EJ-9 BOARD
S169 EJECT
J930 REMOTE
CN930
LINCS DC
S930 STANDBY
LOCK
S931 START/STOP
SW-111 BOARD
(See page 124.)
S551 START/STOP
MC-36 BOARD
(See page 115.)
(See page 115.)
SS-93 BOARD
DRUM VIDEO HEAD
CH 1
CH 2
CH 1'
CN003
REC/PB AMP
IC301
CCD-F70 MODEL
FP134
VA-42 BOARD (SERVO)
(See page 116.)
PB RF
Q250 BUFFER
LPF
PR RF (VIDEO, AUDIO)
PRE AMP
GCA
BALANCED MODULATOR
3f H BPF
f H BPF
AMP
PEAK DET
SAMPLING HOLD
SCHMITT
IC250 ATF SERVO
REC AFT RF
Q251, 252
OSC
X250 5.9MHz
PB
Q253
Q254
1/56 1/50 1/36 1/40


SS-93 BOARD
(SERVO/SYSTEM CONTROL)
(See page 121.)
FP-118 BOARD
CC-7 BOARD
(See page 120.)
FP-53 BOARD
(See page 120.)
PA-24 BOARD
(See page 120.)
SW-111 BOARD
(See page 124.)
MC-36 BOARD
(See page 115.)
PA-24 BOARD
(See page 120.)
IC001
SERVO/MECHANISM CONTROL
IC003
LOADING MOTOR DRIVE
IC004
DRUM MOTOR DRIVE
IC006
IC007
CAPSTAN MOTOR DRIVE
IC250
ATF SERVO
IC369
IC102
DRUM
FLYING ERASE HEAD
Q302 AMP
Q303 ERESE OSC
Q301 ERASE CURRENT SWITCH
FE ON
ME/MP
LITHIUM BATTERY
CAMERA (VC-63)
CAMERA (VC-61)
DIGITAL TITLE
VIDEO (VA-42)
AUDIO (VA-42)
VIDEO (VA-42)
DATA TO SLAVE
DATA TO MASTER
CLK
CS
SLAVE RESET
STB
REF V
LINCS PWR
CC DOWN
CAM STB
FADER CONT
CAN STBY
CAM REC
A MUTE
VTR POWER
CAM POWER
VA PB MODE
SP/LP
RF SWP
SLOW GAIN
RF PB MODE
FE ON
H CHG
JOG
JOG VD
CLOG
V MUTE
ATF LOCK
ATF ERR
SLOW
TS-B
RP PB MODE
SEL 16k/47k
SEL 1
SEL 2
D FG
D PG
C FG
WAVE SHAPER
DC BIAS
Q076,078
Q071(1/2)
D003
D004
TP303
TP006
TP007
IC006 ② REC/PB
IC006 ③ REC/PB
IC006 ②,③ REC/PB
0.03Vp-p
4.8Vp-p
1.4msec
IC006 ⑦ REC/PB
5Vp-p
2V
IC006 ⑨ REC/PB
4.8Vp-p
12msec
IC001 ⑭ REC/PB
5Vp-p
IC001 ㉔ REC/PB
4Vp-p
12MHz
IC001 ㉕ REC/PB
2.6Vp-p
12MHz
DEW
T/E LED
LOAD
UNLOAD
REC PROOF
MODE SW1
MODE SW2
MODE SW3
T REEL FG
S REEL FG
TOP SENS
END SENS
SP/LP EDIT
STILL ADJ
BATTERY LVL
VA REF
DRUM BLK
X TAL IN
X TAL OUT
SWP DLY
D PWM
BLK PLS
C PWM
CAP FWD/RVS
CAP ON
Q007 LED DRIVE
LOAD MTR(+)
LOAD MTR(−)
M903 LOADING MOTOR
MODE SWITCH
D302 T/E SENS
T/E SENS LED
S304 T-REEL FG
S303 S-REEL FG
ME/MP
REC PROOF
CC DOWN S902
S301
Q006 TAPE TOP DETECT
PH002 TAPE TOP SENSOR
Q005 TAPE END DETECT
PH001 TAPE END SENSOR
RV001 BATTERY LEVEL
RV003 STILL
CCD-F70 MODEL
EVER 5V
UNREG
VTR POWER (Q071)
Q075
S990 EDIT
POWER OFF
OVER LOAD DET
BRAKE
18 CONTROL
EMF DET
CW/CCW
EMF MIX
STARTER
M901 DRUM MOTOR
DRUM(U)
DRUM(V)
DRUM(W)
D COM
X001 12MHz
RV002 SWITCH POSITION
Q053(1/2)
Q052 PWM POWER DRIVE
Q055
Q051 PWM POWER DRIVE
LPF
Q054 STARTER
120° LOGIC
HE POWER
M902 CAPSTAN MOTOR
CAP(U)
CAP(V)
CAP(W)
HALL DEVICE
VH(+)
UHE(+),(−)
VHE(+),(−)
WHE(+),(−)
S930 STANDBY
S931 START/STOP
S551 START/STOP
J930 REMOTE
LINCS DC
EVER 5V DETECT
SCHMITT
AMP
SAMPLING HOLD
Q253
Q254
CAPSTAN FG
Q101,102

3-8. MECHANISM CONTROLLER (µPD78112-GF)

This is the 8-bit, single chip microprocessor having the following characteristics.

- µCOM-78K/I
- high speed instruction execution
  Instruction cycle : 333ns/12MHz
- On-chip memory mapping for peripheral hardware (special function register)
- On-chip high function interrupt controller
  Two kinds of processing forms (vector interrupt function/macro service function)
- On-chip high precision A/D converter
  8 bit precision : 8 analog inputs
  One analog input conversion time : 26.7µs/12MHz
- On-chip hardware suitable for servo control of VTR, etc. (servo control unit)
  16 bit free running counter+capture register×2
  special pulse output control function 12 bit precision PWM output×2

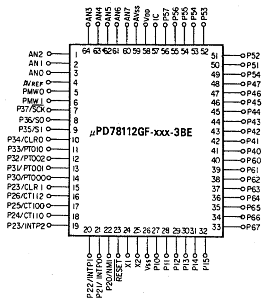

AN3
AN4
AN5
AN6
AN7
AVss
VDD
IC
P57
P56
P55
P54
P53
AN2
AN1
AN0
AVREF
PMW0
PMW1
P37/SCK
P36/S0
P35/SI
P34/CLR0
P33/PT010
P32/PT002
P31/PT001
P30/PT000
P23/CLR1
P26/CT112
P25/CT100
P24/CT110
P23/INTP2
µPD78112GF-xxx-3BE
P52
P51
P54
P47
P46
P45
P44
P43
P42
P41
P40
P60
P61
P62
P63
P64
P65
P66
P67
P22/INTP10
P21/INTP00
P20/NMI
RESET
X1
X2
Vss
P10
P11
P12
P13
P14
P15
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51
52 53 54 55 56 57 58 59 60 61 62 63 64

Fig. 1. µPD78112 pin assignment diagram

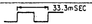
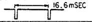
Pin No.	Signal name	I/O	Signal status	Function
1	DEW	I	Analog input	DEW detecting pin. When DEW (condensation) occurs, more than 430mV generates.
2	ATF ERR	I	Analog input	ATF ERROR input pin.
3	SWP DLY	I	Analog input	RF SWP adjustment input pin.
4	VA REF	O		A/D converter reference voltage input pin.
5	D PWM	O	PWM output	Drum motor drive signal.
6	C PWM	O	PWM output	Capstan motor drive signal.
7	CLK	I		Serial communication clock input.
8	DATA TO MSTR	O		Data output pin for the data to be sent to mode control CPU.
9	DATA TO SLVE	I		Data input pin for the data coming from the mode control CPU.
10	D PG	I		Drum PG input pin.
11	SP/$\overline{\text{LP}}$	O	Logic status	Playback mode output pin. SP="H", LP="L"
12	JOG	O	Logic status	Video circuit normal/variable speed playback select signal. "H" during STILL, SLOW, FRAM, CUE/REV, FR SEARCH, REC REV, EDIT CUE, EDIT REV.
13	JOG VD	O	Logic status	False VD output inserted into video signal during variable speed playback mode.
14	RF SWP	O	 33.3mSEC	RF SWP output pin.
15	REF V	I	 16.6mSEC	REF V input pin.
16				
17	D FG	I		Drum FG input.
18	C FG	I		Capstan FG input.
19	$\overline{\text{END SENS}}$	I	Logic status	END-side END sensor input.

Table 1 (1)

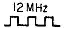
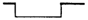
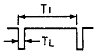
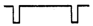
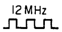
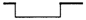
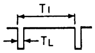
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>20</td><td>CLOG</td><td>I</td><td>Logic status</td><td>Head clogging detect input.</td></tr>
<tr><td>21</td><td>$\overline{\text{TOP SENS}}$</td><td>I</td><td>Logic status</td><td>TOP-side TOP sensor input.</td></tr>
<tr><td>22</td><td>$\overline{\text{CS}}$</td><td>I</td><td>Logic status</td><td>Input signal to start data communication. Starting at fall-down edge.</td></tr>
<tr><td>23</td><td>$\overline{\text{SLVE RESET}}$</td><td>I</td><td>Logic status</td><td>RESET input. "L" RESET.</td></tr>
<tr><td>24</td><td>X'TAL IN</td><td>I</td><td rowspan="2">12 MHz
</td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>25</td><td>X'TAL OUT</td><td>O</td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>26</td><td>V_{SS}</td><td></td><td></td><td>GND pin</td></tr>
<tr><td>27</td><td>VA PB MODE</td><td>O</td><td>Logic status</td><td>Video, audio REC/PB select signal. "H" during PB.</td></tr>
<tr><td>28</td><td>V MUTE</td><td>O</td><td>Logic status</td><td>Video, muting signal. "H" during muting.</td></tr>
<tr><td>29</td><td>A MUTE</td><td>O</td><td>Logic status</td><td>Audio, muting signal. "H" during muting.</td></tr>
<tr><td>30</td><td>VIDEO CS</td><td>O</td><td></td><td>Input signal to start video data communication.</td></tr>
<tr><td>31</td><td>$\overline{\text{T/E LED}}$</td><td>O</td><td>T1
TL</td><td>Tape top/end detecting LED ON/OFF.
Reel rotation detecting LED ON/OFF.
<table>
<tr><th>mode</th><th>REC/PB</th><th>CUE/REV</th><th>FF/REW</th></tr>
<tr><td>T_1</td><td>100</td><td>14</td><td>2</td></tr>
<tr><td>T_L</td><td>1</td><td>1</td><td>1</td></tr>
</table>
(unit in msec)</td></tr>
<tr><td>32</td><td></td><td></td><td></td><td></td></tr>
<tr><td>33</td><td>CAP ON</td><td>O</td><td>Logic status</td><td>Capstan motor ON/OFF signal. "H" level means capstan motor ON.</td></tr>
<tr><td>34</td><td>$\overline{\text{ATF LOCK}}$</td><td>I</td><td>Logic status</td><td>"L" when PB mode ATF phase servo is normally phase-locked.</td></tr>
<tr><td>35</td><td>VTR Power</td><td>O</td><td>Logic status</td><td>DC-DC converter ON/OFF signal.</td></tr>
<tr><td>36</td><td>CAM Power</td><td>O</td><td>Logic status</td><td>
<table>
<tr><th>mode</th><th>VTR Power</th><th>CAM Power</th></tr>
<tr><td>VTR</td><td>"H"</td><td>"L"</td></tr>
<tr><td>OFF</td><td>"L"</td><td>"L"</td></tr>
<tr><td>CAM</td><td>"H"</td><td>"H"</td></tr>
</table></td></tr>
<tr><td>37</td><td>VIDEO CLK</td><td>I</td><td> </td><td>Clock for video serial data communication.</td></tr>
<tr><td>38</td><td>TS B</td><td>O</td><td></td><td>ATF LOCK sampling hold signal. "L" during sampling mode. "H" during hold mode.</td></tr>
<tr><td>39</td><td>CAP BLK</td><td>O</td><td>Logic status</td><td>This is the signal that applies full voltage to capstan motor.</td></tr>
<tr><td>40</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td>Logic status</td><td>Capstan motor rotating direction select signal. "H" during normal direction (FWD) rotation.</td></tr>
<tr><td>41</td><td>LOAD</td><td>O</td><td>Logic status</td><td>Threading motor control signal.</td></tr>
<tr><td>42</td><td>UNLOAD</td><td>O</td><td>Logic status</td><td>
<table>
<tr><th>Operation
Signal name</th><th>LOAD</th><th>UNLOAD</th><th>BRAKE</th></tr>
<tr><td>LOAD</td><td>H</td><td>L</td><td>H</td></tr>
<tr><td>UNLOAD</td><td>L</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>43</td><td>RP PB MODE</td><td>O</td><td>Logic status</td><td>REC/PB amplifier REC/PB select signal. "H" during PB.</td></tr>
<tr><td>44</td><td>$\overline{\text{FE ON}}$</td><td>O</td><td>Logic status</td><td>Flying erase oscillation ON/OFF signal, "L" during oscillation.</td></tr>
</table>

Table 1 (2)

<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>20</td><td>CLOG</td><td>I</td><td>Logic status</td><td>Head clogging detect input.</td></tr>
<tr><td>21</td><td>$\overline{\text{TOP SENS}}$</td><td>I</td><td>Logic status</td><td>TOP-side TOP sensor input.</td></tr>
<tr><td>22</td><td>$\overline{\text{CS}}$</td><td>I</td><td>Logic status</td><td>Input signal to start data communication. Starting at fall-down edge.</td></tr>
<tr><td>23</td><td>$\overline{\text{SLVE RESET}}$</td><td>I</td><td>Logic status</td><td>RESET input. “L” RESET.</td></tr>
<tr><td>24</td><td>X’TAL IN</td><td>I</td><td rowspan="2"> </td><td>To be used for system clock. X’tal should be connected.</td></tr>
<tr><td>25</td><td>X’TAL OUT</td><td>O</td><td>To be used for system clock. X’tal should be connected.</td></tr>
<tr><td>26</td><td>V_{SS}</td><td></td><td></td><td>GND pin</td></tr>
<tr><td>27</td><td>VA PB MODE</td><td>O</td><td>Logic status</td><td>Video, audio REC/PB select signal. “H” during PB.</td></tr>
<tr><td>28</td><td>V MUTE</td><td>O</td><td>Logic status</td><td>Video, muting signal. “H” during muting.</td></tr>
<tr><td>29</td><td>A MUTE</td><td>O</td><td>Logic status</td><td>Audio, muting signal. “H” during muting.</td></tr>
<tr><td>30</td><td>VIDEO CS</td><td>O</td><td></td><td>Input signal to start video data communication.</td></tr>
<tr><td>31</td><td>$\overline{\text{T/E LED}}$</td><td>O</td><td> </td><td>Tape top/end detecting LED ON/OFF.
Reel rotation detecting LED ON/OFF.
<table>
<tr><th>mode</th><th>REC/PB</th><th>CUE/REV</th><th>FF/REW</th></tr>
<tr><td>T_I</td><td>100</td><td>14</td><td>2</td></tr>
<tr><td>T_L</td><td>1</td><td>1</td><td>1</td></tr>
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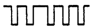
(unit in msec)</td></tr>
<tr><td>32</td><td></td><td></td><td></td><td></td></tr>
<tr><td>33</td><td>CAP ON</td><td>O</td><td>Logic status</td><td>Capstan motor ON/OFF signal. “H” level means capstan motor ON.</td></tr>
<tr><td>34</td><td>$\overline{\text{ATF LOCK}}$</td><td>I</td><td>Logic status</td><td>“L” when PB mode ATF phase servo is normally phase-locked.</td></tr>
<tr><td>35</td><td>VTR Power</td><td>O</td><td>Logic status</td><td rowspan="2">DC-DC converter ON/OFF signal.
<table>
<tr><th>mode</th><th>VTR Power</th><th>CAM Power</th></tr>
<tr><td>VTR</td><td>“H”</td><td>“L”</td></tr>
<tr><td>OFF</td><td>“L”</td><td>“L”</td></tr>
<tr><td>CAM</td><td>“H”</td><td>“H”</td></tr>
</table></td></tr>
<tr><td>36</td><td>CAM Power</td><td>O</td><td>Logic status</td></tr>
<tr><td>37</td><td>VIDEO CLK</td><td>I</td><td></td><td>Clock for video serial data communication.</td></tr>
<tr><td>38</td><td>TS B</td><td>O</td><td> </td><td>ATF LOCK sampling hold signal. “L” during sampling mode. “H” during hold mode.</td></tr>
<tr><td>39</td><td>CAP BLK</td><td>O</td><td>Logic status</td><td>This is the signal that applies full voltage to capstan motor.</td></tr>
<tr><td>40</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td>Logic status</td><td>Capstan motor rotating direction select signal. “H” during normal direction (FWD) rotation.</td></tr>
<tr><td>41</td><td>LOAD</td><td>O</td><td>Logic status</td><td rowspan="2">Threading motor control signal.
<table>
<tr><th>Operation / Signal name</th><th>LOAD</th><th>UNLOAD</th><th>BRAKE</th></tr>
<tr><td>LOAD</td><td>H</td><td>L</td><td>H</td></tr>
<tr><td>UNLOAD</td><td>L</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>42</td><td>UNLOAD</td><td>O</td><td>Logic status</td></tr>
<tr><td>43</td><td>RP PB MODE</td><td>O</td><td>Logic status</td><td>REC/PB amplifier REC/PB select signal. “H” during PB.</td></tr>
<tr><td>44</td><td>$\overline{\text{FE ON}}$</td><td>O</td><td>Logic status</td><td>Flying erase oscillation ON/OFF signal, “L” during oscillation.</td></tr>
</table>

Table 1 (2)

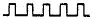
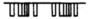
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>45</td><td>SEL1</td><td>O</td><td>Logic status</td><td rowspan="2">ATF REF PILOT signal frequency control.
<table>
<tr><th>ATF REF PILOT</th><th>f_1</th><th>f_2</th><th>f_3</th><th>f_4</th></tr>
<tr><td>SEL1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>SEL2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
</table></td></tr>
<tr><td>46</td><td>SEL2</td><td>O</td><td>Logic status</td></tr>
<tr><td>47</td><td>SEL 16K/$\overline{\text{47K}}$</td><td>O</td><td>Logic status</td><td>ATF BPF select signal. “L” when detecting ATF error in f1 and f3 tracks.
“H” when detecting ATF error in f2 and f4 tracks.</td></tr>
<tr><td>48</td><td>HCHG</td><td>O</td><td>Logic status</td><td>Head select signal. “H”=CH-1’ “L”=CH-1.</td></tr>
<tr><td>49</td><td>$\overline{\text{REC PROOF SW}}$</td><td>I</td><td>Logic status</td><td>“H” when cassette’s erroneous erasure preventing switch is set in the erasure prevention side.</td></tr>
<tr><td>50</td><td>MSW1</td><td>I</td><td>Logic status</td><td rowspan="3">Mechanism mode switch input (three bit structure, mechanical position detection)</td></tr>
<tr><td>51</td><td>MSW2</td><td>I</td><td>Logic status</td></tr>
<tr><td>52</td><td>MSW3</td><td>I</td><td>Logic status</td></tr>
<tr><td>53</td><td>VIDEO SO</td><td>O</td><td></td><td>Data line for the data to be sent to CXA1201.</td></tr>
<tr><td>54</td><td>$\overline{\text{EDIT}}$</td><td>I</td><td></td><td>Input signal for EDIT selection. “H” : OFF. “L” : ON</td></tr>
<tr><td>55</td><td>DRUM BLK</td><td>O</td><td>Logic status</td><td>Slow mode drum fH compensation drum brake signal.</td></tr>
<tr><td>56</td><td>SLOW GAIN</td><td>O</td><td>Logic status</td><td>ATF ERROR’s gain select signal.</td></tr>
<tr><td>57</td><td>VPP</td><td></td><td></td><td>Fixed to power supply voltage.</td></tr>
<tr><td>58</td><td>V_{DD}</td><td></td><td></td><td>Power supply pin.</td></tr>
<tr><td>59</td><td>AV_{SS}</td><td></td><td></td><td>A/D converter’s GND pin.</td></tr>
<tr><td>60</td><td>STILL ADJ</td><td>I</td><td></td><td>Const. Resistornce input. ← CCD-F50</td></tr>
<tr><td>61</td><td></td><td></td><td></td><td></td></tr>
<tr><td>62</td><td>BATT LVL</td><td>I</td><td>Analog input</td><td>BATTERY LEVEL input. This is input at approx. 1/2.</td></tr>
<tr><td>63</td><td>T REEL FG</td><td>I</td><td>Analog input</td><td>Take-up side REEL FG input. Used to detect reel rotation.</td></tr>
<tr><td>64</td><td>S REEL FG</td><td>I</td><td>Analog input</td><td>Supply side REEL FG input. Used to detect reel rotation.</td></tr>
</table>

Table 1 (3)

3-9. SYSTEM CONTROL-CAMERA BLOCK INTERFACE

Signal	I/O	Pin No.	Input/Output Level
$\overline{\text{AF ON}}$	O	SS-93 board IC200⑤	"L" when auto focus in ON.
$\overline{\text{TELE IN}}$	I	SS-93 board IC200③	"L" when zoom switch TELE is pressed.
$\overline{\text{WIDE IN}}$	I	SS-93 board IC200④	"L" when zoom switch WIDE is pressed.
$\overline{\text{TALLY}}$	O	SS-93 board IC200㊵	"L" when in CAMERA mode and REC mode.
CAM STB	O	FC-25 board IC101(51)	4V cycle "H" pulse. ( ) Strobe signal for serial data transmission.
CLK	O	FC-25 board IC101㊴	2V cycle "L" pulse series. () Serial data transmission clock.
DATA TO SLAVE	O	FC-25 board IC101㊵	2V cycle pulse series. ( ) Serial data transmission.
TELE OUT	O	SS-93 board IC200⑦	"H" during the zoom motor is rotating TELE direction.
WIDE OUT	O	SS-93 board IC200⑧	"H" during the zoom motor is rotating WIDE direction.
BACK LIGHT	O	SS-93 board IC200⑥	"H" during Back Light is lit.

3-10. SYSTEM CONTROL—VIDEO, AUDIO BLOCK INTERFACE

Signal	I/O	Pin No.	VTR mode						
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARC
						CUE	REVIEW		CUE
SP/$\overline{\text{LP}}$	O	SS-93 board IC001⑪	H	H	H	* 1	* 1	* 2	* 1
JOG	O	SS-93 board IC001⑫	L	L	L	H	H	L	H
JOG VD	O	SS-93 board IC001⑬	L	L	L	* 3	* 3	L	* 3
RF SWP	O	SS-93 board IC001⑭	H/L	* 4	* 4	* 4	* 4	* 4	* 4
REF V	O	SS-93 board IC001⑮	* 5	* 5	* 5	L	L	L	L
CLOG	I	SS-93 board IC001⑳	H	* 6	* 6	* 6	* 6	* 6	* 6
VA PB MODE	O	SS-93 board IC001㉗	L	L	L	H	H	H	H
V MUTE	O	SS-93 board IC001㉘	L	L	L	L	L	L	L
A MUTE	O	SS-93 board IC001㉙	L	L	L	H	H	L	H
CAM PWR	O	SS-93 board IC001㊱	L	L	L	L	L	L	L
RP PB MODE	O	SS-93 board IC001㊸	H	H	H	H	H	H	H
$\overline{\text{FE ON}}$	O	SS-93 board IC001㊹	H	H	H	H	H	H	H
TAPE2/$\overline{\text{TAPE1}}$	O	FP-53 board S301	"L" when using MP type tape.						
$\overline{\text{EDIT}}$	O	PA-24 board S990	"L" when EDIT switch (PA-24 board S990) is turuned ON.						
DATA TO SLAVE	O	FC-25 board IC101㊵	V cycle "L" pulse series (VTR mode)						
CLK	O	FC-25 board IC101㊴	V cycle "L" pulse series (VTR mode)						
CG STB	O	FC-25 board IC101㉜	L	L	L	L	L	L	L

* 1 Outputs identification results is PB mode immediately preceding. SP mode "H", LP mode "L".

* 2 Outputs identification results of playback tape recording mode (SP/LP). SP mode "H", LP mode "L".

* 3 False VD signal (V cycle "H" pulse)

* 4 30Hz 50% duty pulse. Synchronized to drum rotation.

* 5 V cycle "L" pulse separated from line input video signal or camera video signal.

* 6 "H" at tape no signal portion or dropout portion. Input for head clogging detection.

* 9 V cyclse pulse.

*10 2V cyclse pulse. ( ).

*11 2V cyclse pulse series.

3-11. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	VTR MODE						
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARC
						CUE	REVIEW		CUE
ATF ERR	I	SS-93 board IC001②		* 1	* 1	* 2	* 2	* 2	* 2
SWP DLY * 3	I	SS-93 board IC001③							
D PWM	O	SS-93 board IC001⑤	L	* 4	* 4	* 4	* 4	* 4	* 4
C PWM	O	SS-93 board IC001⑥	L	* 5	* 5	* 5	* 5	* 5	* 5
D PG	I	SS-93 board IC001⑩	L	* 6	* 6	* 6	* 6	* 6	* 6
RF SWP	O	SS-93 board IC001⑭	H/L	* 7	* 7	* 7	* 7	* 7	* 7
REF V	I	SS-93 board IC001⑮	* 8	* 8	* 8	L	L	L	L
D FG	I	SS-93 board IC001⑰	H	* 9	* 9	* 9	* 9	* 9	* 9
C FG	I	SS-93 board IC001⑱	H/L	*10	*10	*11	*12	*13	*11
CAP ON	O	SS-93 board IC001㉝	L	H	H	H	H	H	H
$\overline{\text{ATF LOCK}}$	I	SS-93 board IC001㉞		H	H	H	H	L	H
$\overline{\text{TS B}}$	O	SS-93 board IC001㊳	H	H	H	H	H	*15	H
CAP BLK	O	SS-93 board IC001㊴	L	L	L	L	L	L	L
CAP FWD/$\overline{\text{RVS}}$	O	SS-93 board IC001㊵	H	H	L	H	L	H	H
SEL1	O	SS-93 board IC001㊺	L	L	L	*18	*19	*15	*18
SEL2	O	SS-93 board IC001㊻	L	L	L	*18	*19	*15	*18
SEL 16K/$\overline{\text{47K}}$	O	SS-93 board IC001㊼	L	L	L	*18	*19	*15	*18
SLOW GAIN	O	SS-93 board IC001(56)	L	L	L	L	L	L	L

* 1 Fixed voltage approx. 2V DC.

* 2 ATF error voltage.

* 3 DC voltage set by RV002 is input.

* 4 53μsec cycle PWM wave. Duty ratio changes according to drum error signal.

* 5 53μsec cycle PWM wave. Duty ratio changes according to capstan error signal.

* 6 V cycle "H" pulse. ( )

* 7 30Hz 50% duty pulse ( ). Synchronized to drum rotation.

* 8 V cycle "L" pulse separated from line input video signal or ca

* 9 720Hz pulse

*10 Approx. 16500Hz pulse

*11 Approx. 5900Hz pulse (SP mode)

*12 Approx. 5600Hz pulse (SP mode)

*13 Approx. 826Hz pulse (SP mode)

*14 Pulse input during step-by-step.

3-10. SYSTEM CONTROL—VIDEO, AUDIO BLOCK INTERFACE

Signal	I/O	Pin No.	VTR mode													CAMERA mode			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REVIEW	REC
						CUE	REVIEW		CUE	REVIEW									
SP/$\overline{\text{LP}}$	O	SS-93 board IC001⑪	H	H	H	＊1	＊1	＊2	＊1	＊1	＊1	＊1	＊1	H	H	H	H	H	H
JOG	O	SS-93 board IC001⑫	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
JOG VD	O	SS-93 board IC001⑬	L	L	L	＊3	＊3	L	＊3	＊3	＊3	＊3	＊3	L	L	L	＊3	＊3	L
RF SWP	O	SS-93 board IC001⑭	H/L	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4
REF V	O	SS-93 board IC001⑮	＊5	＊5	＊5	L	L	L	L	L	L	L	L	＊5	＊5	＊5	L	L	＊5
CLOG	I	SS-93 board IC001⑳	H	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	H			＊6	＊6	H
VA PB MODE	O	SS-93 board IC001㉗	L	L	L	H	H	H	H	H	H	H	H	L	L	L	H	H	L
V MUTE	O	SS-93 board IC001㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
A MUTE	O	SS-93 board IC001㉙	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
CAM PWR	O	SS-93 board IC001㊱	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H
RP PB MODE	O	SS-93 board IC001㊸	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
$\overline{\text{FE ON}}$	O	SS-93 board IC001㊹	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
TAPE2/$\overline{\text{TAPE1}}$	O	FP-53 board S301	"L" when using MP type tape.																
$\overline{\text{EDIT}}$	O	PA-24 board S990	"L" when EDIT switch (PA-24 board S990) is turuned ON.																
DATA TO SLAVE	O	FC-25 board IC101㊵	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CLK	O	FC-25 board IC101㊴	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CG STB	O	FC-25 board IC101㉜	L	L	L	L	L	L	L	L	L	L	L	L	L	＊11	＊11	＊11	＊11

＊1 Outputs identification results is PB mode immediately preceding. SP mode "H", LP mode "L".

＊2 Outputs identification results of playback tape recording mode (SP/LP). SP mode "H", LP mode "L".

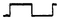
＊3 False VD signal (V cycle "H" pulse)

＊4 30Hz 50% duty pulse. Synchronized to drum rotation.

＊5 V cycle "L" pulse separated from line input video signal or camera video signal.

＊6 "H" at tape no signal portion or dropout portion. Input for head clogging detection.

＊9 V cyclse pulse.

＊10 2V cyclse pulse. ().

＊11 2V cyclse pulse series.

3-11. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	VTR MODE													CAMERA MODE			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REV	REC
						CUE	REVIEW		CUE	REVIEW									
ATF ERR	I	SS-93 board IC001②		＊1	＊1	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊2	＊1			＊2	＊2	＊1
SWP DLY ＊3	I	SS-93 board IC001③																	
D PWM	O	SS-93 board IC001⑤	L	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4	＊4
C PWM	O	SS-93 board IC001⑥	L	＊5	＊5	＊5	＊5	＊5	＊5	＊5	L	＊5	＊5	＊5	L	L	＊5	＊5	＊5
D PG	I	SS-93 board IC001⑩	L	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6
RF SWP	O	SS-93 board IC001⑭	H/L	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7
REF V	I	SS-93 board IC001⑮	＊8	＊8	＊8	L	L	L	L	L	L	L	L	＊8	＊8	＊8	L	L	＊8
D FG	I	SS-93 board IC001⑰	H	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9	＊9
C FG	I	SS-93 board IC001⑱	H/L	＊10	＊10	＊11	＊12	＊13	＊11	＊12	H/L	＊14	＊14	＊13	H/L	H/L	＊13	＊13	＊13
CAP ON	O	SS-93 board IC001㉝	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{ATF LOCK}}$	I	SS-93 board IC001㉞		H	H	H	H	L	H	H	H	H	H	H	H	H	L	L	H
$\overline{\text{TS B}}$	O	SS-93 board IC001㊳	H	H	H	H	H	＊15	H	H	H	H	H	H	H	H	＊15	＊16	H
CAP BLK	O	SS-93 board IC001㊴	L	L	L	L	L	L	L	L	L	＊17	＊17	L	L	L	L	L	L
CAP FWD/$\overline{\text{RVS}}$	O	SS-93 board IC001㊵	H	H	L	H	L	H	H	L	H	H	H	H	H	H	H	L	H
SEL1	O	SS-93 board IC001㊺	L	L	L	＊18	＊19	＊15	＊18	＊19	H	＊20	＊20	＊21	L	L	＊15	＊16	＊21
SEL2	O	SS-93 board IC001㊻	L	L	L	＊18	＊19	＊15	＊18	＊19	H/L	＊20	＊20	＊21	H	H	＊15	＊16	＊21
SEL 16K/$\overline{\text{47K}}$	O	SS-93 board IC001㊼	L	L	L	＊18	＊19	＊15	＊18	＊19	L	＊20	＊20	L	L	L	＊15	＊16	L
SLOW GAIN	O	SS-93 board IC001(56)	L	L	L	L	L	L	L	L	H	H	H	L	L	L	L	L	L

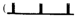
＊1 Fixed voltage approx. 2V DC.

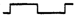
＊2 ATF error voltage.

＊3 DC voltage set by RV002 is input.

＊4 53μsec cycle PWM wave. Duty ratio changes according to drum error signal.

＊5 53μsec cycle PWM wave. Duty ratio changes according to capstan error signal.

＊6 V cycle "H" pulse. ()

＊7 30Hz 50% duty pulse (). Synchronized to drum rotation.

＊8 V cycle "L" pulse separated from line input video signal or camera video signal.

＊9 720Hz pulse

＊10 Approx. 16500Hz pulse

＊11 Approx. 5900Hz pulse (SP mode)

＊12 Approx. 5600Hz pulse (SP mode)

＊13 Approx. 826Hz pulse (SP mode)

＊14 Pulse input during step-by-step.

＊15 Refer to Timing Chart 1

＊16 Refer to Timing Chart 2

＊17 "H" pulse output during step-by-step

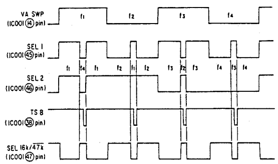
＊18 Refer to Timing Chart 3

＊19 Refer to Timing Chart 4

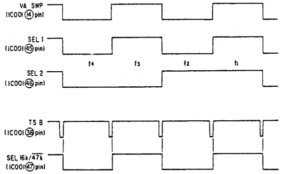
＊20 Pulse output during step-by-step

＊21 Refer to Timing Chart 5

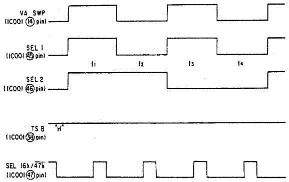
3-11-1. TIMING CHART 1 (PB, EDIT CUE)


VA SWP (IC001⑭pin)
f1
f2
f3
f4
SEL 1 (IC001㊺pin)
f1 f4 f1 f2 f1 f2 f3 f2 f3 f4 f3 f4
SEL 2 (IC001㊻pin)
TS B (IC001㊳pin)
SEL 16k/$\overline{47k}$ (IC001㊼pin)

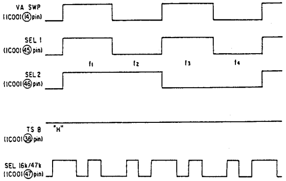
3-11-2. TIMING CHART 2 (EDIT REVIEW)


VA SWP (IC001⑭pin)
SEL 1 (IC001㊺pin)
f4
f3
f2
f1
SEL 2 (IC001㊻pin)
TS B (IC001㊳pin)
SEL 16k/$\overline{47k}$ (IC001㊼pin)

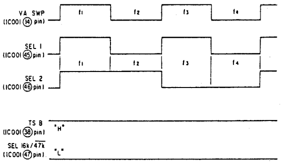
3-11-3. TIMING CHART 3 (CUE)


VA SWP (IC001⑭pin)
SEL 1 (IC001㊺pin)
f1
f2
f3
f4
SEL 2 (IC001㊻pin)
TS B (IC001㊳pin)
"H"
SEL 16k/$\overline{47k}$ (IC001㊼pin)

3-11-4. TIMING CHART 4 (REVIEW)


VA SWP (IC001⑭pin)
SEL 1 (IC001㊺pin)
f1
f2
f3
f4
SEL 2 (IC001㊻pin)
TS B (IC001㊳pin)
"H"
SEL 16k/47k (IC001㊼pin)

3-11-5. TIMING CHART 5 (REC)

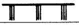
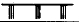
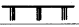
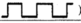
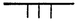

VA SWP (IC001⑭pin)
f1
f2
f3
f4
SEL 1 (IC001㊺pin)
f1
f2
f3
f4
SEL 2 (IC001㊻pin)
TS B (IC001㊳pin)
"H"
SEL 16k/$\overline{47k}$ (IC001㊼pin)
"L"

3-12. SYSTEM CONTROL—PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	Input/Output Level
DEW	I	SS-93 board IC001①	Dew sensor input. Input voltage increases when there is dew.
VA REF	I	SS-93 board IC001④	Reference voltage input (5V DC) for A-D conversion of pin ① (DEW), pin ② (ATF ERR) and pin ③ (SWP DLY) input analog voltage (0-5V DC).
CLK	I	SS-93 board IC001⑦	Clock input from serial data transmission mode control (FD-6 board IC151). V cycle "L" pulse (‾‖‾‾‖‾‾‖‾) in VTR mode.
DATA TO MASTER	O	SS-93 board IC001⑧	Serial data output to mode control. V cycle "L" pulse (‾‖‾‾‖‾‾‖‾) in VTR mode.
DATA TO SLAVE	I	SS-93 board IC001⑨	Serial data input from mode control. V cycle "L" pulse (‾‖‾‾‖‾‾‖‾) in VTR mode.
$\overline{\text{END SENS}}$	I	SS-93 board IC001⑲	TAPE END sensor (SS-93 board PH001) input. "L" pulse input at tape end. Normally "H".
$\overline{\text{TOP SENS}}$	I	SS-93 board IC001㉑	TAPE TOP sensor (SS-93 board PH002) input. "L" pulse input at tape top. Normally "H".
$\overline{\text{CS}}$	I	SS-93 board IC001㉒	Serial signal Chip select signal input from mode control. V cycle pulse. (_⎍_⎍_)
$\overline{\text{SLAVE RESET}}$	I	SS-93 board IC001㉓	Reset signal input from mode control. Goes "L" when power is turned ON/OFF and servo/mechanism control (SS-93 board IC001) is reset.
$\overline{\text{T/E LED}}$	O	SS-93 board IC001㉛	Pulse output (‾‾|‾|‾|‾‾) for lighting up T/E SENS LED (FP-53 board D302). REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW "L" when LED is lit up. REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW 3msec cycle.
VTR POWER	O	SS-93 board IC001㉟	VTR power ON/OFF signal output. "H" during VTR mode and CAMERA mode. Operates DC-DC converter, and generates VTR 5V.
CAM POWER	O	SS-93 board IC001㊱	Camera power ON/OFF signal output. "H" during CAMERA mode. Operates DC-DC converter and generates voltages used for camera.
LOAD	O	SS-93 board IC001㊶	"H" during cassette loading.
UNLOAD	O	SS-93 board IC001㊷	"H" during cassette eject.
$\overline{\text{REC PROOF}}$	I	SS-93 board IC001㊾	"H" when cassette which can not be recorded (erase prevention) is inserted.
M SW1	I	SS-93 board IC001㊿	Mode switch input for mechanism. Indicates mechanism position.
M SW2	I	SS-93 board IC001(51)	
M SW3	I	SS-93 board IC001(52)	

Mechanism position	READY	REC/PB/ CUE/REV/FF/REW	GL	STOP	EJECT	Mid-position
M SW1	L	H	H	H	L	H
M SW2	H	H	L	L	L	H
M SW3	H	L	L	H	H	H

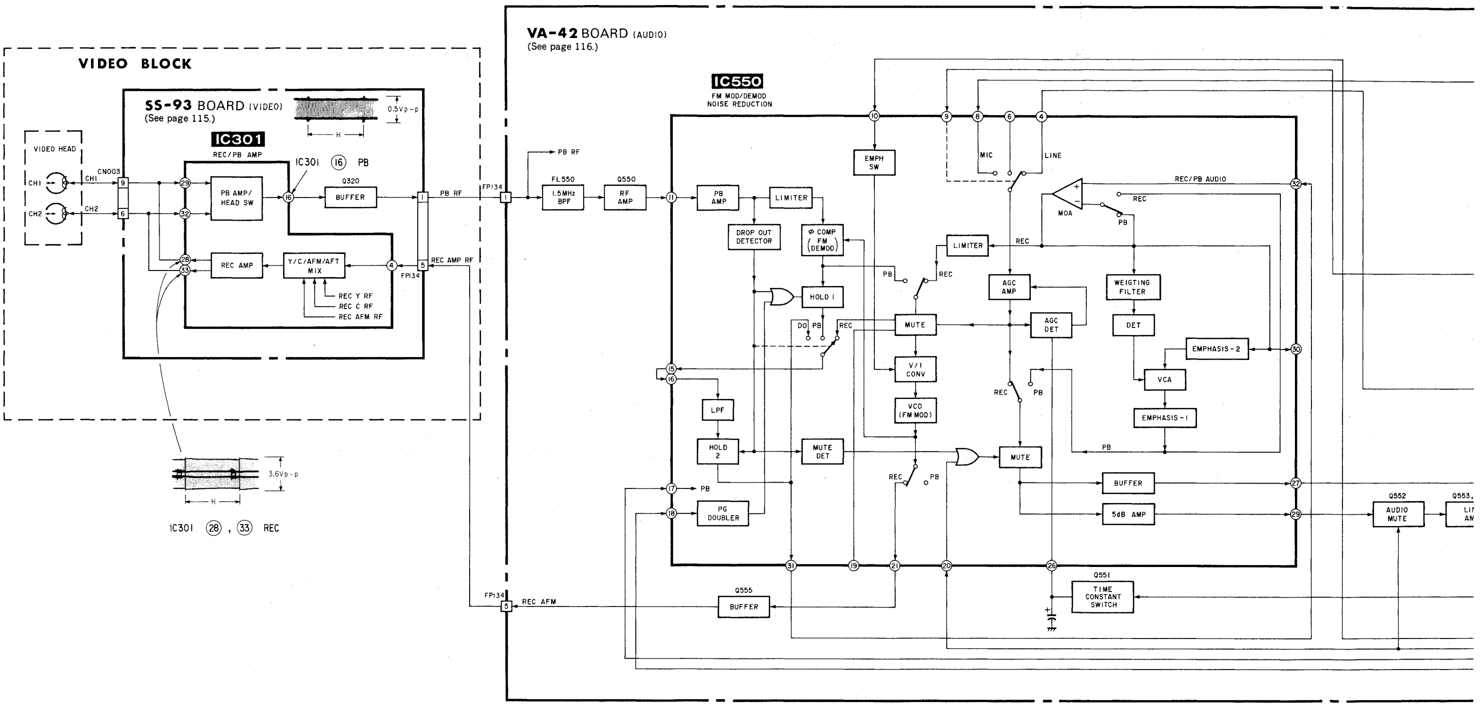
3-12. SYSTEM CONTROL—PERIPHERAL CIRCUIT INTERFACE

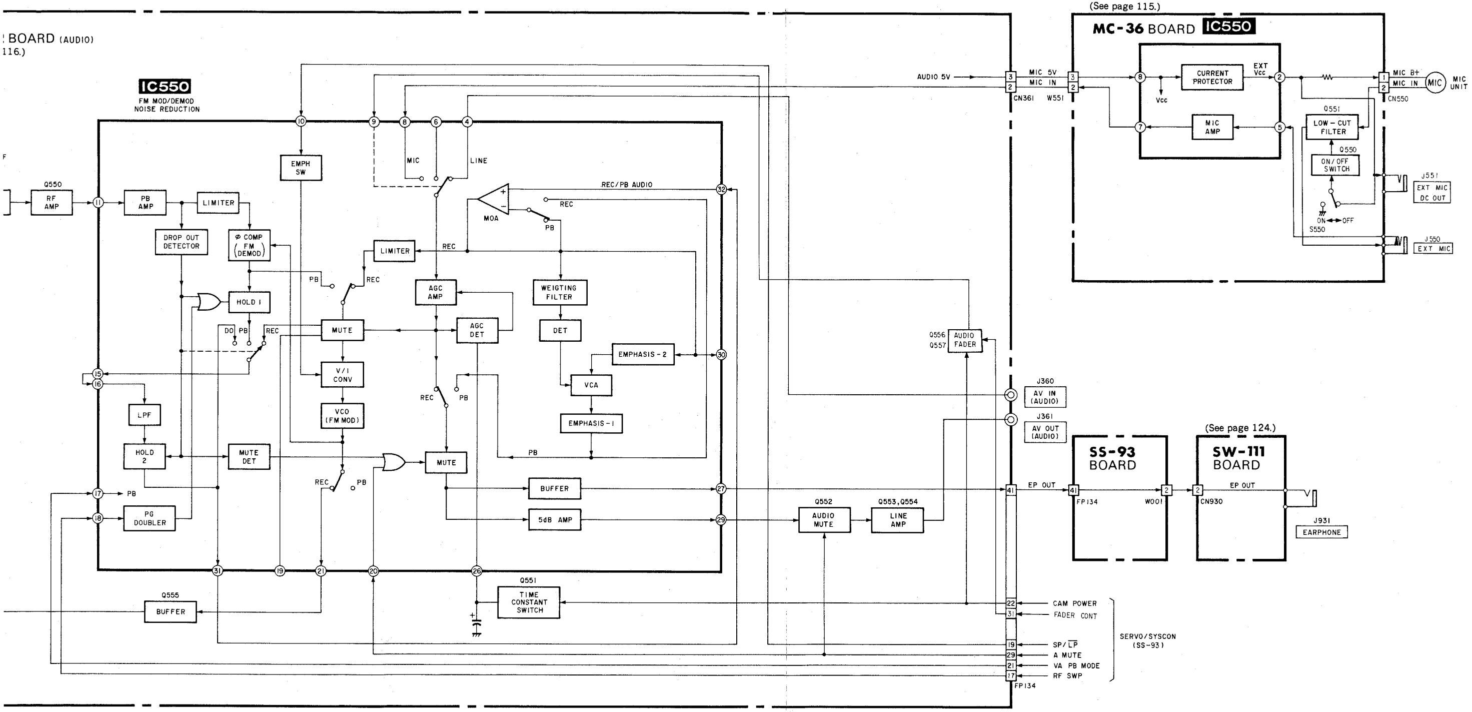
Signal	I/O	Pin No.	Input/Output Level
DEW	I	SS-93 board IC001①	Dew sensor input. Input voltage increases when there is dew.
VA REF	I	SS-93 board IC001④	Reference voltage input (5V DC) for A-D conversion of pin ① (DEW), pin ② (ATF ERR) and pin ③ (SWP DLY) input analog voltage (0-5V DC).
CLK	I	SS-93 board IC001⑦	Clock input from serial data transmission mode control (FD-6 board IC151). V cycle "L" pulse () in VTR mode.
DATA TO MASTER	O	SS-93 board IC001⑧	Serial data output to mode control. V cycle "L" pulse () in VTR mode.
DATA TO SLAVE	I	SS-93 board IC001⑨	Serial data input from mode control. V cycle "L" pulse () in VTR mode.
$\overline{\text{END SENS}}$	I	SS-93 board IC001⑲	TAPE END sensor (SS-93 board PH001) input. "L" pulse input at tape end. Normally "H".
$\overline{\text{TOP SENS}}$	I	SS-93 board IC001㉑	TAPE TOP sensor (SS-93 board PH002) input. "L" pulse input at tape top. Normally "H".
$\overline{\text{CS}}$	I	SS-93 board IC001㉒	Serial signal Chip select signal input from mode control. V cycle pulse. ()
$\overline{\text{SLAVE RESET}}$	I	SS-93 board IC001㉓	Reset signal input from mode control. Goes "L" when power is turned ON/OFF and servo/mechanism control (SS-93 board IC001) is reset.
$\overline{\text{T/E LED}}$	O	SS-93 board IC001㉛	Pulse output () for lighting up T/E SENS LED (FP-53 board D302). REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW "L" when LED is lit up. REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW 3msec cycle.
VTR POWER	O	SS-93 board IC001㉟	VTR power ON/OFF signal output. "H" during VTR mode and CAMERA mode. Operates DC-DC converter, and generates VTR 5V.
CAM POWER	O	SS-93 board IC001㊱	Camera power ON/OFF signal output. "H" during CAMERA mode. Operates DC-DC converter and generates voltages used for camera.
LOAD	O	SS-93 board IC001㊶	"H" during cassette loading.
UNLOAD	O	SS-93 board IC001㊷	"H" during cassette eject.
$\overline{\text{REC PROOF}}$	I	SS-93 board IC001㊾	"H" when cassette which can not be recorded (erase prevention) is inserted.
M SW1	I	SS-93 board IC001㊿	Mode switch input for mechanism. Indicates mechanism position.
M SW2	I	SS-93 board IC001(51)	
M SW3	I	SS-93 board IC001(52)	

Mechanism position	READY	REC/PB/ CUE/REV/FF/REW	GL	STOP	EJECT	Mid-position
M SW1	L	H	H	H	L	H
M SW2	H	H	L	L	L	H
M SW3	H	L	L	H	H	H

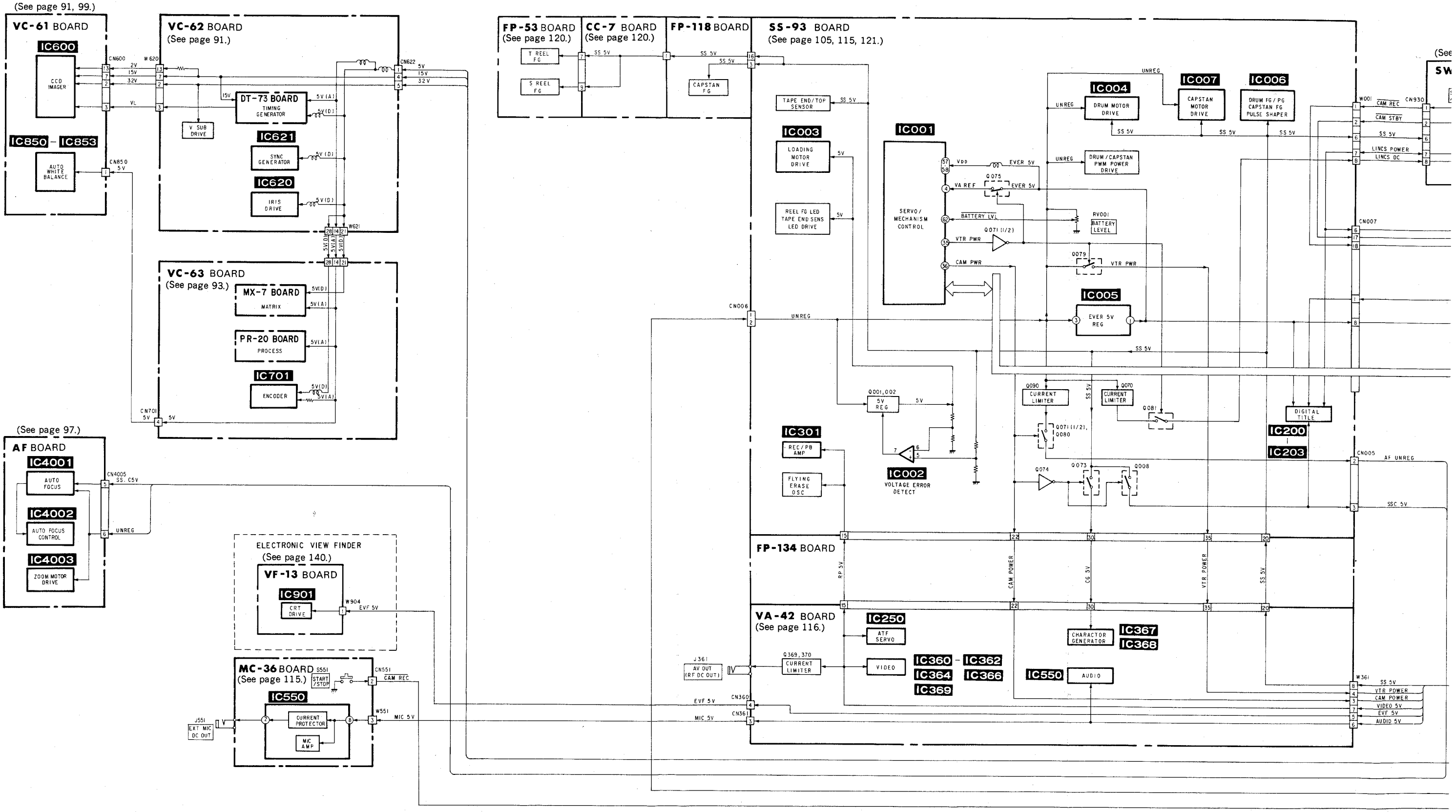
Signal	I/O	Pin No.	Input/Output Level
V SO	O	SS-93 board IC001(53)	Video serial data output.
BATTERY LEVEL	I	SS-93 board IC001(62)	Main battery voltage level detection input.
T REEL FG	I	SS-93 board IC001(63)	T REEL FG (FP-53 board D304) input. Pulse corresponds to S reel rotation.
S REEL FG	I	SS-93 board IC001(64)	S REEL FG (FP-53 board D303) input. Pulse corresponds to S reel rotation.

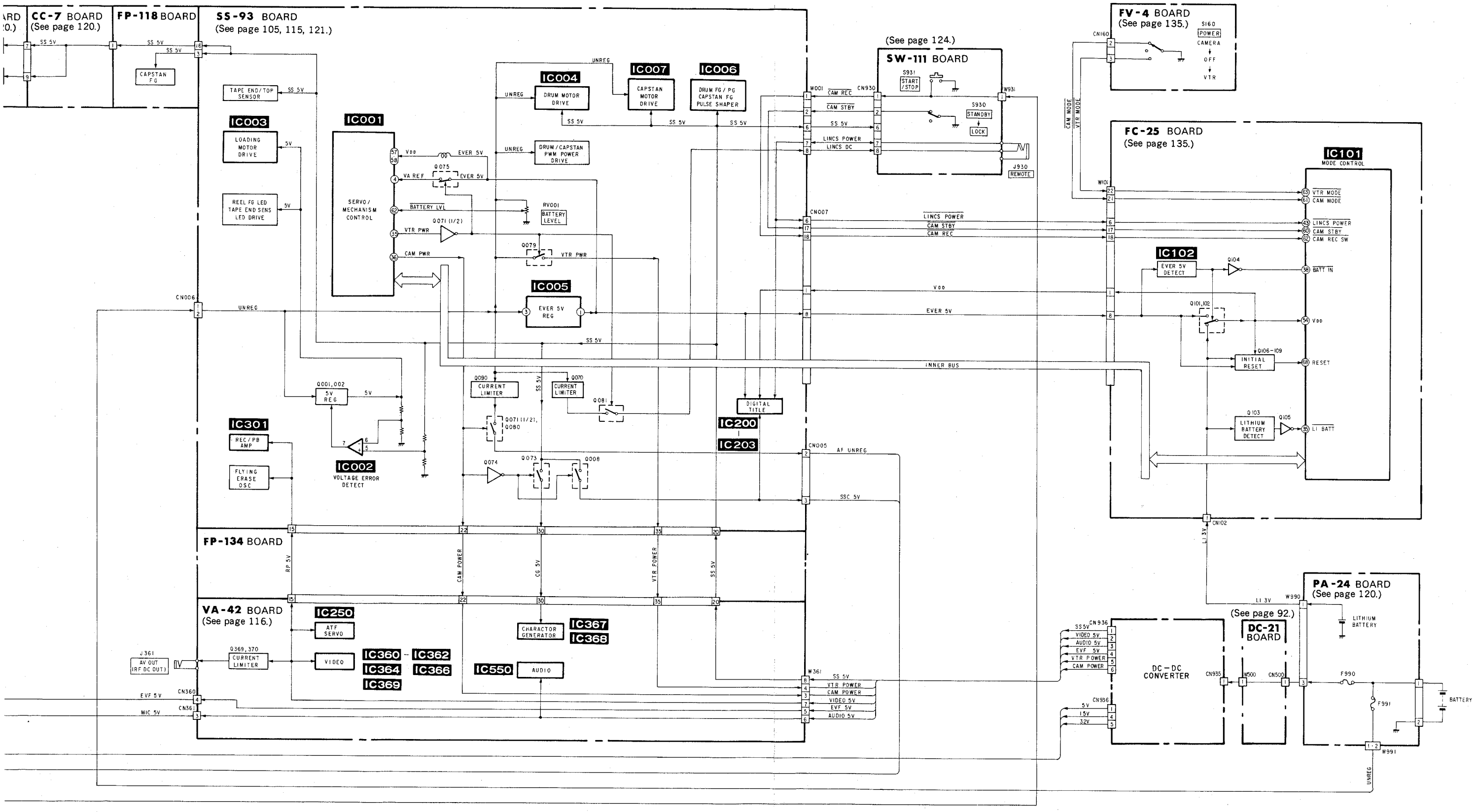
3-13. AUDIO BLOCK DIAGRAM


VIDEO BLOCK
SS-93 BOARD (VIDEO)
(See page 115.)
0.5Vp-p
H
IC301
REC/PB AMP
IC301 ⑯ PB
VIDEO HEAD
CH1
CH2
CN003
PB AMP/
HEAD SW
Q320
BUFFER
PB RF
FP134
REC AMP
Y/C/AFM/AFT
MIX
REC AMP RF
REC Y RF
REC C RF
REC AFM RF
3.6Vp-p
IC301 ㉘, ㉝ REC
VA-42 BOARD (AUDIO)
(See page 116.)
IC550
FM MOD/DEMOD
NOISE REDUCTION
PB RF
FL550
1.5MHz
BPF
Q550
RF
AMP
PB
AMP
LIMITER
DROP OUT
DETECTOR
φ COMP
(FM DEMOD)
HOLD 1
DO
PB
REC
EMPH
SW
MIC
LINE
REC/PB AUDIO
MOA
REC
PB
LIMITER
AGC
AMP
AGC
DET
WEIGTING
FILTER
DET
MUTE
V/I
CONV
VCO
(FM MOD)
EMPHASIS-2
VCA
EMPHASIS-1
LPF
HOLD
2
MUTE
DET
MUTE
PG
DOUBLER
BUFFER
5dB AMP
Q552
AUDIO
MUTE
Q553,
LI
AM
Q551
TIME
CONSTANT
SWITCH
Q555
BUFFER
REC AFM

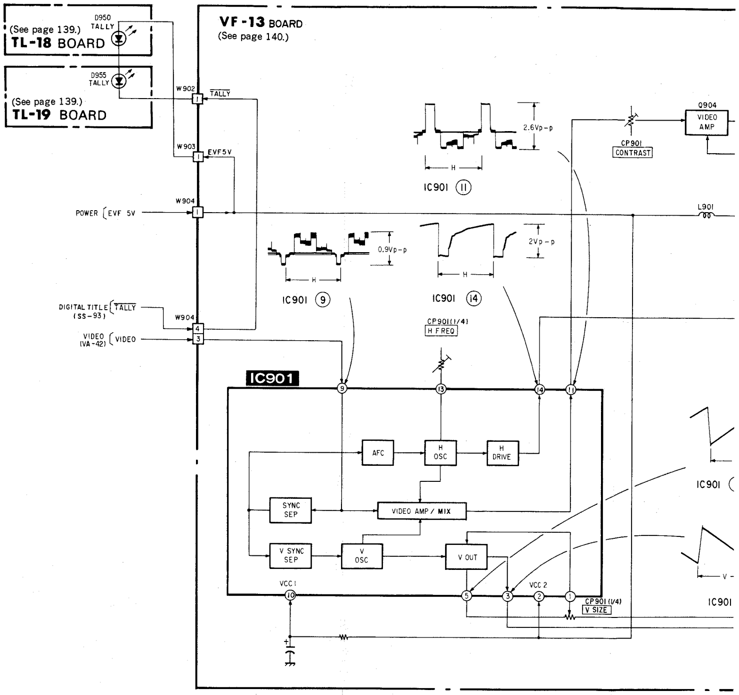

BOARD (AUDIO)
116.)
IC550
FM MOD/DEMOD
NOISE REDUCTION
Q550
RF AMP
PB AMP
LIMITER
DROP OUT DETECTOR
φ COMP (FM DEMOD)
HOLD 1
DO
PB
REC
EMPH SW
MIC
LINE
MOA
REC/PB AUDIO
LIMITER
AGC AMP
AGC DET
WEIGTING FILTER
DET
EMPHASIS-2
VCA
EMPHASIS-1
MUTE
V/I CONV
VCO (FM MOD)
LPF
HOLD 2
MUTE DET
MUTE
BUFFER
5dB AMP
PB
PG DOUBLER
Q555
BUFFER
Q551
TIME CONSTANT SWITCH
AUDIO 5V
MIC 5V
MIC IN
CN361
W551
(See page 115.)
MC-36 BOARD IC550
CURRENT PROTECTOR
EXT Vcc
Vcc
MIC AMP
Q551
LOW-CUT FILTER
Q550
ON/OFF SWITCH
ON OFF
S550
MIC B+
MIC IN
MIC
MIC UNIT
CN550
J551
EXT MIC DC OUT
J550
EXT MIC
Q556
Q557
AUDIO FADER
J360
AV IN (AUDIO)
J361
AV OUT (AUDIO)
Q552
AUDIO MUTE
Q553, Q554
LINE AMP
EP OUT
(See page 124.)
SS-93 BOARD
FP134
W001
SW-111 BOARD
CN930
EP OUT
J931
EARPHONE
CAM POWER
FADER CONT
SP/$\overline{LP}$
A MUTE
VA PB MODE
RF SWP
SERVO/SYSCON (SS-93)
FP134

3-14. POWER SUPPLY BLOCK DIAGRAM

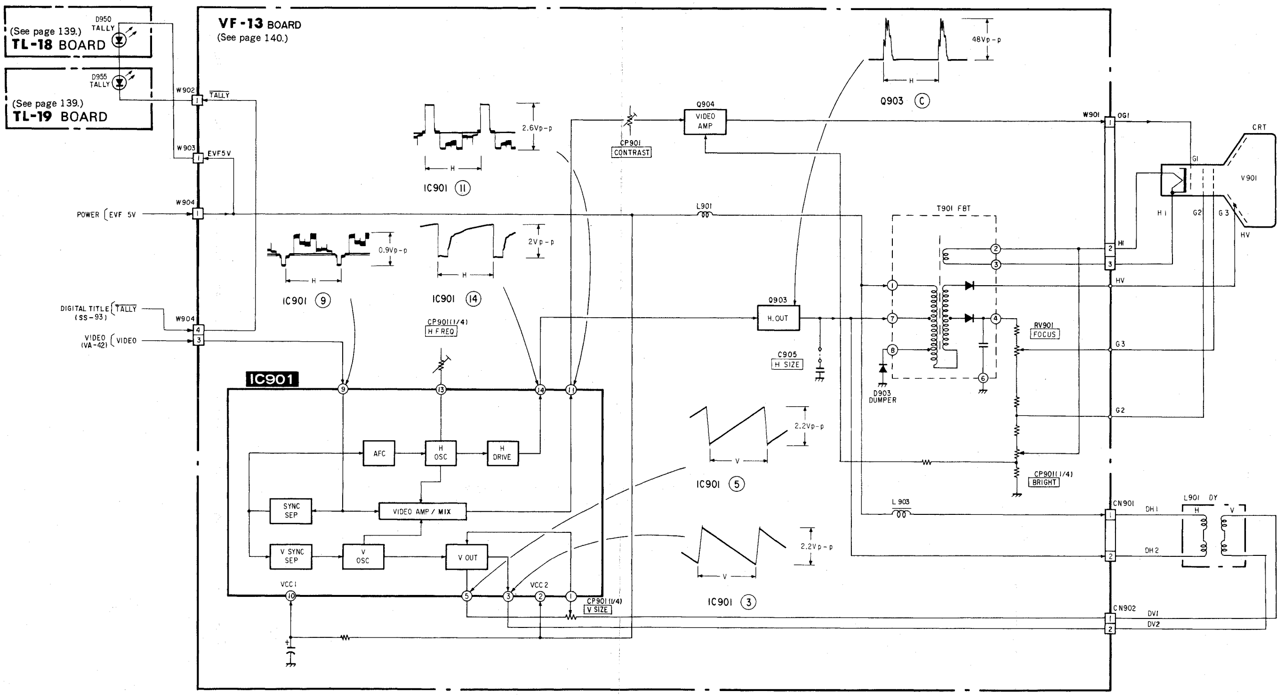

(See page 91, 99.)
VC-61 BOARD
IC600
CCD IMAGER
IC850 - IC853
AUTO WHITE BALANCE
CN600
CN850 5V
VC-62 BOARD
(See page 91.)
W620
2V
15V
32V
VL
15V
DT-73 BOARD
TIMING GENERATOR
V SUB DRIVE
IC621
SYNC GENERATOR
IC620
IRIS DRIVE
5V(A)
5V(D)
CN622
5V
15V
32V
W621
VC-63 BOARD
(See page 93.)
MX-7 BOARD
MATRIX
PR-20 BOARD
PROCESS
IC701
ENCODER
CN701 5V
5V
(See page 97.)
AF BOARD
IC4001
AUTO FOCUS
IC4002
AUTO FOCUS CONTROL
IC4003
ZOOM MOTOR DRIVE
CN4005
SS C5V
UNREG
ELECTRONIC VIEW FINDER
(See page 140.)
VF-13 BOARD
IC901
CRT DRIVE
W904
EVF 5V
MC-36 BOARD
(See page 115.)
S551
START/STOP
CN551
CAM REC
IC550
CURRENT PROTECTOR
MIC AMP
W551
MIC 5V
J551
EXT MIC DC OUT
FP-53 BOARD
(See page 120.)
T REEL FG
S REEL FG
CC-7 BOARD
(See page 120.)
SS 5V
FP-118 BOARD
CAPSTAN FG
SS-93 BOARD
(See page 105, 115, 121.)
TAPE END/TOP SENSOR
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/MECHANISM CONTROL
VDD
EVER 5V
Q075
VA REF
BATTERY LVL
RV001 BATTERY LEVEL
Q071 (1/2)
VTR PWR
Q079
CAM PWR
IC004
DRUM MOTOR DRIVE
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
DRUM/CAPSTAN PWM POWER DRIVE
UNREG
IC005
EVER 5V REG
CN006
Q001,002
5V REG
IC002
VOLTAGE ERROR DETECT
IC301
REC/PB AMP
FLYING ERASE OSC
Q090
CURRENT LIMITER
Q070
CURRENT LIMITER
Q071 (1/2), Q080
Q081
Q074
Q073
Q008
DIGITAL TITLE
IC200
IC203
W001
CN930
CAM REC
CAM STBY
LINCS POWER
LINCS DC
CN007
CN005
AF UNREG
SSC 5V
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
VA-42 BOARD
(See page 116.)
IC250
ATF SERVO
Q369,370
CURRENT LIMITER
VIDEO
IC360 - IC362
IC364
IC366
IC369
CHARACTOR GENERATOR
IC367
IC368
IC550
AUDIO
J361
AV OUT (RF DC OUT)
EVF 5V
MIC 5V
CN360
CN361
W361
VTR POWER
CAM POWER
VIDEO 5V
AUDIO 5V
(See
SW


CC-7 BOARD
(See page 120.)
FP-118 BOARD
SS-93 BOARD
(See page 105, 115, 121.)
SS 5V
CAPSTAN FG
TAPE END/TOP SENSOR
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/MECHANISM CONTROL
VDD
EVER 5V
Q075
VA REF
BATTERY LVL
Q071 (1/2)
VTR PWR
CAM PWR
UNREG
IC004
DRUM MOTOR DRIVE
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
DRUM/CAPSTAN PWM POWER DRIVE
RV001
BATTERY LEVEL
Q079
IC005
EVER 5V REG
CN006
Q001,002
5V REG
IC301
REC/PB AMP
FLYING ERASE OSC
IC002
VOLTAGE ERROR DETECT
Q090
CURRENT LIMITER
Q070
CURRENT LIMITER
Q081
Q071 (1/2), Q080
Q074
Q073
Q008
DIGITAL TITLE
IC200
IC203
CN005
AF UNREG
SSC 5V
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
VA-42 BOARD
(See page 116.)
IC250
ATF SERVO
J361
AV OUT (RF DC OUT)
Q369, 370
CURRENT LIMITER
VIDEO
IC360 – IC362
IC364
IC366
IC369
CHARACTOR GENERATOR
IC367
IC368
IC550
AUDIO
EVF 5V
MIC 5V
CN360
CN361
W361
VIDEO 5V
AUDIO 5V
(See page 124.)
SW-111 BOARD
S931
START/STOP
S930
STANDBY
LOCK
W001
CN930
W931
CAM REC
CAM STBY
LINCS POWER
LINCS DC
J930
REMOTE
CN007
INNER BUS
FV-4 BOARD
(See page 135.)
CN160
S160
POWER
CAMERA
OFF
VTR
CAM MODE
VTR MODE
FC-25 BOARD
(See page 135.)
IC101
MODE CONTROL
W101
CAM REC SW
IC102
EVER 5V DETECT
Q104
BATT IN
Q101,102
Q106–109
INITIAL RESET
RESET
Q103
LITHIUM BATTERY DETECT
Q105
LI BATT
CN102
LI 3V
PA-24 BOARD
(See page 120.)
W990
LITHIUM BATTERY
F990
F991
BATTERY
W991
(See page 92.)
DC-21 BOARD
DC-DC CONVERTER
CN936
CN935
W500
CN500
SS 5V
15V
32V
5V

3-15. VIEWFINDER BLOCK DIAGRAM


(See page 139.)
TL-18 BOARD
D950
TALLY
D955
TALLY
(See page 139.)
TL-19 BOARD
VF-13 BOARD
(See page 140.)
W902
TALLY
W903
EVF5V
W904
POWER
EVF 5V
DIGITAL TITLE
(SS-93)
TALLY
VIDEO
(VA-42)
VIDEO
2.6Vp-p
H
IC901 ⑪
0.9Vp-p
H
IC901 ⑨
2Vp-p
H
IC901 ⑭
CP901(1/4)
H FREQ
CP901
CONTRAST
Q904
VIDEO
AMP
L901
IC901
AFC
H
OSC
H
DRIVE
SYNC
SEP
VIDEO AMP / MIX
V SYNC
SEP
V
OSC
V OUT
VCC 1
VCC 2
CP901(1/4)
V SIZE
IC901
V
IC901

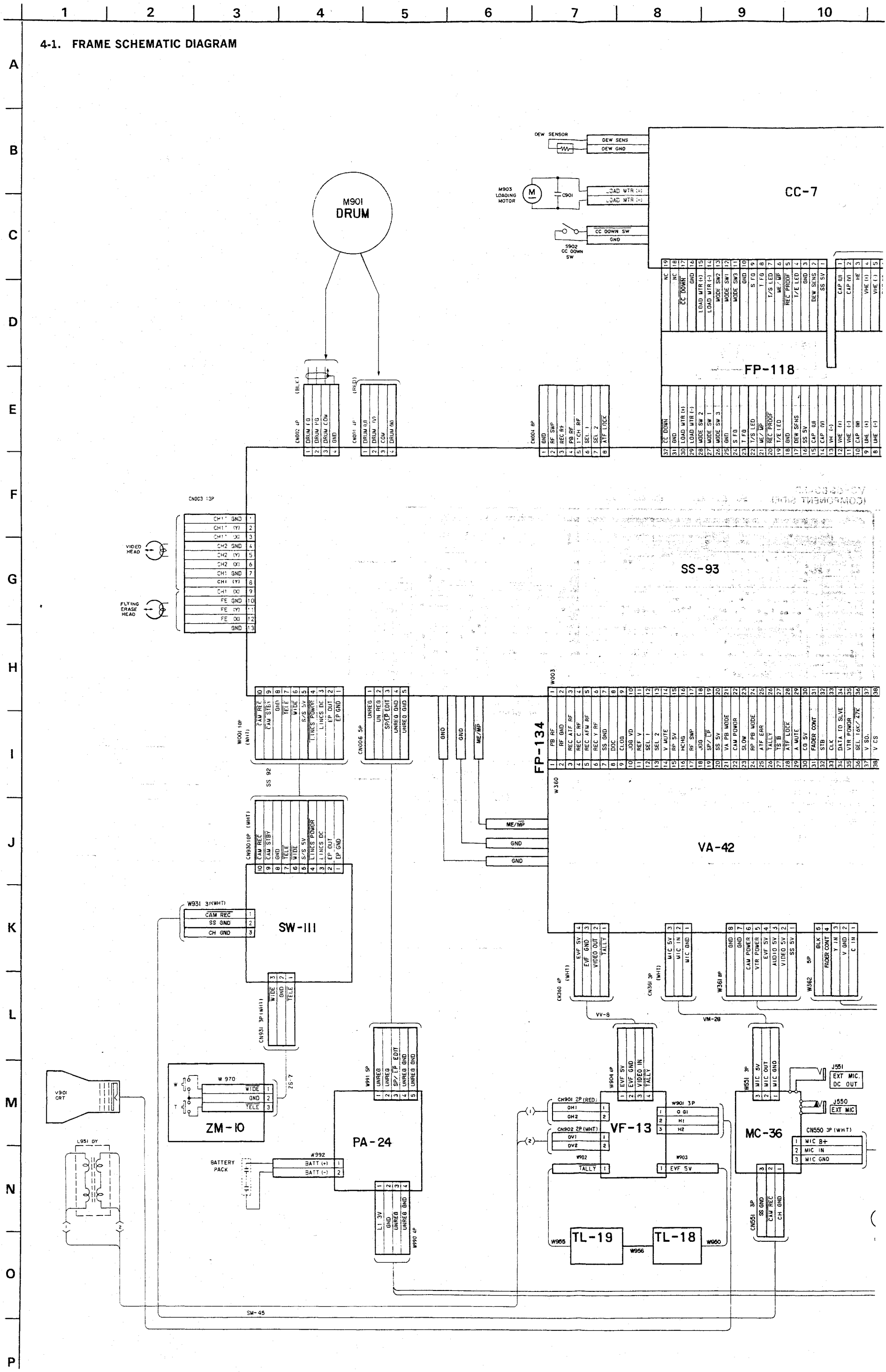
3-15. VIEWFINDER BLOCK DIAGRAM



(See page 139.)
TL-18 BOARD
D950
TALLY
D955
TALLY
(See page 139.)
TL-19 BOARD
VF-13 BOARD
(See page 140.)
W902
TALLY
W903
EVF5V
W904
POWER
EVF 5V
DIGITAL TITLE (SS-93)
TALLY
VIDEO (VA-42)
VIDEO
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP / MIX
V SYNC SEP
V OSC
V OUT
VCC 1
VCC 2
CP901(1/4)
H FREQ
CP901(1/4)
V SIZE
CP901
CONTRAST
Q904
VIDEO AMP
L901
Q903
H.OUT
C905
H SIZE
D903
DUMPER
T901 FBT
RV901
FOCUS
CP901(1/4)
BRIGHT
L903
W901
OG1
H1
HV
G3
G2
CN901
DH1
DH2
CN902
DV1
DV2
L901 DY
H
V
CRT
V901
G1
G2
G3
HV
2.6Vp-p
IC901 ⑪
0.9Vp-p
IC901 ⑨
2Vp-p
IC901 ⑭
48Vp-p
Q903 Ⓒ
2.2Vp-p
IC901 ⑤
2.2Vp-p
IC901 ③
H
V

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



1
2
3
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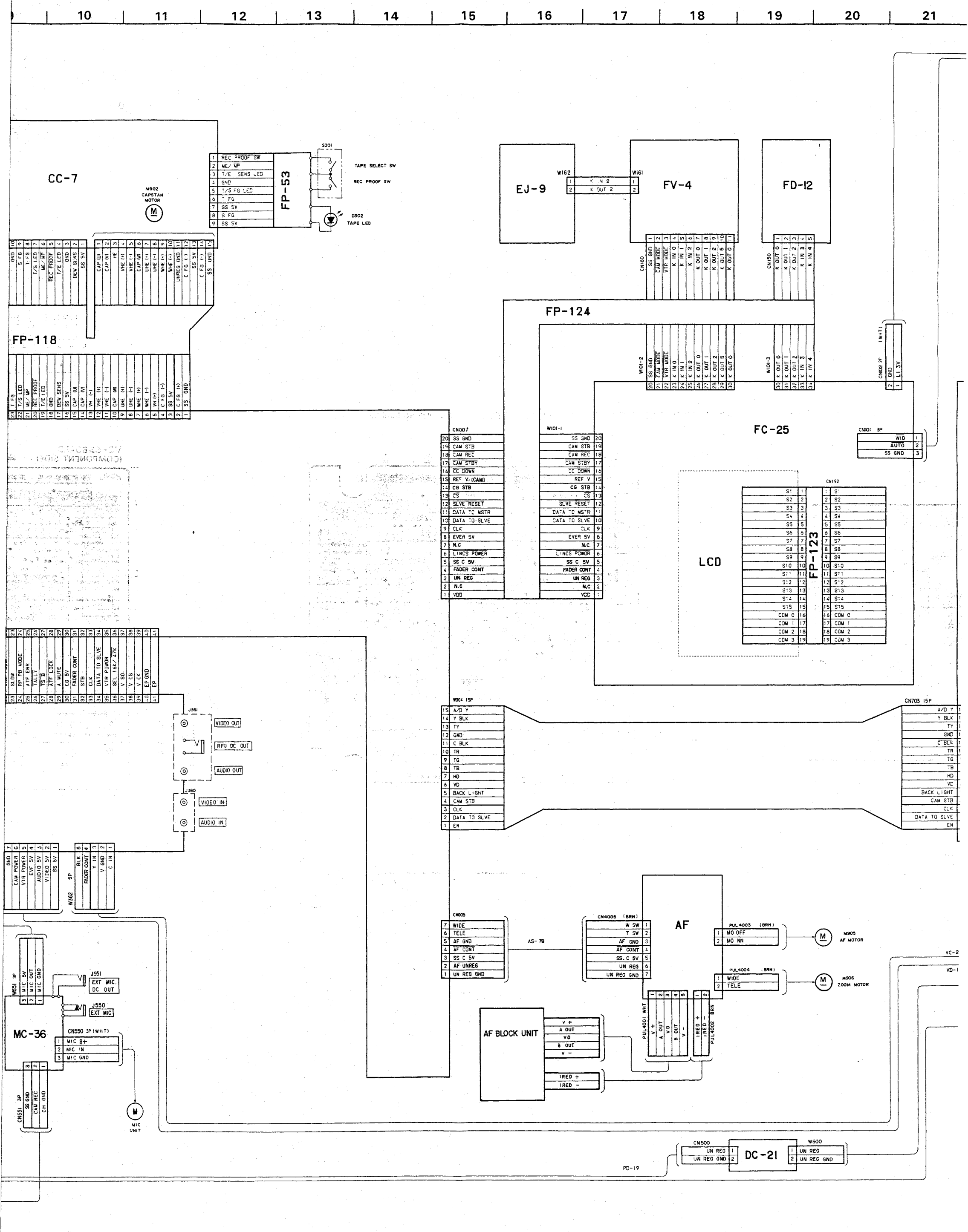
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
M901
DRUM
DEW SENSOR
DEW SENS
DEW GND
M903
LOADING
MOTOR
M
C901
LOAD MTR (+)
LOAD MTR (−)
CC DOWN SW
GND
S902
CC DOWN
SW
CC-7
NC 19
NC 18
CC DOWN 17
GND 16
LOAD MTR (+) 15
LOAD MTR (−) 14
MODE SW2 13
MODE SW1 12
MODE SW3 11
GND 10
S FG 9
T FG 8
T/S LED 7
ME/MP 6
REC PROOF 5
T/E LED 4
GND 3
DEW SENS 2
SS 5V 1
CAP (U) 1
CAP (V) 2
HE 3
VHE (+) 4
VHE (−) 5
FP-118
32 CC DOWN
31 GND
30 LOAD MTR (+)
29 LOAD MTR (−)
28 MODE SW 2
27 MODE SW 1
26 MODE SW 3
25 GND
24 S FG
23 T FG
22 T/S LED
21 ME/MP
20 REC PROOF
19 T/E LED
18 GND
17 DEW SENS
16 SS 5V
15 CAP (U)
14 CAP (V)
13 VH (−)
12 VHE (+)
11 VHE (−)
10 CAP (W)
9 UHE (+)
8 UHE (−)
(BLK)
CN002 4P
1 DRUM FG
2 DRUM PG
3 DRUM COM
4 GND
(RED)
CN001 4P
1 DRUM (U)
2 DRUM (V)
3 COM
4 DRUM (W)
CN004 8P
1 GND
2 RF SWP
3 REC RF
4 PB RF
5 1'CH RF
6 SEL 1
7 SEL 2
8 ATF LOCK
CN003 13P
VIDEO HEAD
FLYING ERASE HEAD
CH1' GND 1
CH1' (Y) 2
CH1' (X) 3
CH2 GND 4
CH2 (Y) 5
CH2 (X) 6
CH1 GND 7
CH1 (Y) 8
CH1 (X) 9
FE GND 10
FE (Y) 11
FE (X) 12
GND 13
SS-93
W003
FP-134
W360
1 PB RF
2 RF GND
3 REC ATF RF
4 REC C RF
5 REC AFM RF
6 REC Y RF
7 SS GND
8 DOC
9 CLOG
10 JOG VD
11 REF V
12 SEL 1
13 SEL 2
14 V MUTE
15 RP 5V
16 HCHG
17 RF SWP
18 JOG
19 SP/LP
20 SS 5V
21 VA PB MODE
22 CAM POWOR
23 SLOW
24 RP PB MODE
25 ATF ERR
26 TALLY
27 TS B
28 ATF LOCK
29 A MUTE
30 CG 5V
31 FADER CONT
32 STB
33 CLK
34 DATA TO SLVE
35 VTR POWOR
36 SEL 16K/47K
37 V SO.
38 V CS
W001 10P
(WHT)
10 CAM REC
9 CAM STBY
8 GND
7 TELE
6 WIDE
5 S/S 5V
4 LINCS POWOR
3 LINCS DC
2 EP OUT
1 EP GND
SS 92
CN006 5P
1 UNREG
2 UN REG
3 SP/LP EDIT
4 UNREG GND
5 UNREG GND
GND
GND
ME/MP
ME/MP
GND
GND
VA-42
CN930 10P (WHT)
10 CAM REC
9 CAM STBY
8 GND
7 TELE
6 WIDE
5 S/S 5V
4 LINCS POWOR
3 LINCS DC
2 EP OUT
1 EP GND
W931 3P(WHT)
CAM REC 1
SS GND 2
CH GND 3
SW-III
3 WIDE
2 GND
1 TELE
CN931 3P (WHT)
ZS-7
W
T
W 970
WIDE 1
GND 2
TELE 3
ZM-10
V901
CRT
L951 DY
1
2
W991 5P
1 UNREG
2 UNREG
3 SP/LP EDIT
4 UNREG GND
5 UNREG GND
PA-24
BATTERY
PACK
W992
BATT (+) 1
BATT (−) 2
1 L1 3V
2 GND
3 UNREG
4 UNREG GND
W990 4P
SM-45
CN360 4P
(WHT)
4 EVF 5V
3 EVF GND
2 VIDEO OUT
1 TALLY
VV-8
CN361 3P
(WHT)
3 MIC 5V
2 MIC IN
1 MIC GND
VM-28
W361 8P
8 GND
7 GND
6 CAM POWER
5 VTR POWER
4 EVF 5V
3 AUDIO 5V
2 VIDEO 5V
1 SS 5V
W362
5P
5 BLK
4 FADER CONT
3 Y IN
2 V GND
1 C IN
W904 4P
1 EVF 5V
2 EVF GND
3 VIDEO IN
4 TALLY
CN901 2P (RED)
OH1 1
OH2 2
CN902 2P (WHT)
DV1 1
DV2 2
(1)
(2)
VF-13
W901 3P
1 G G1
2 H1
3 H2
W902
TALLY 1
W903
1 EVF 5V
TL-19
TL-18
W955
W956
W950
W551 3P
3 MIC 5V
2 MIC OUT
1 MIC GND
J551
EXT MIC.
DC OUT
J550
EXT MIC
MC-36
CN550 3P (WHT)
1 MIC B+
2 MIC IN
3 MIC GND
CN551 3P
3 SS GND
2 CAM REC
1 CH GND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11
12
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16
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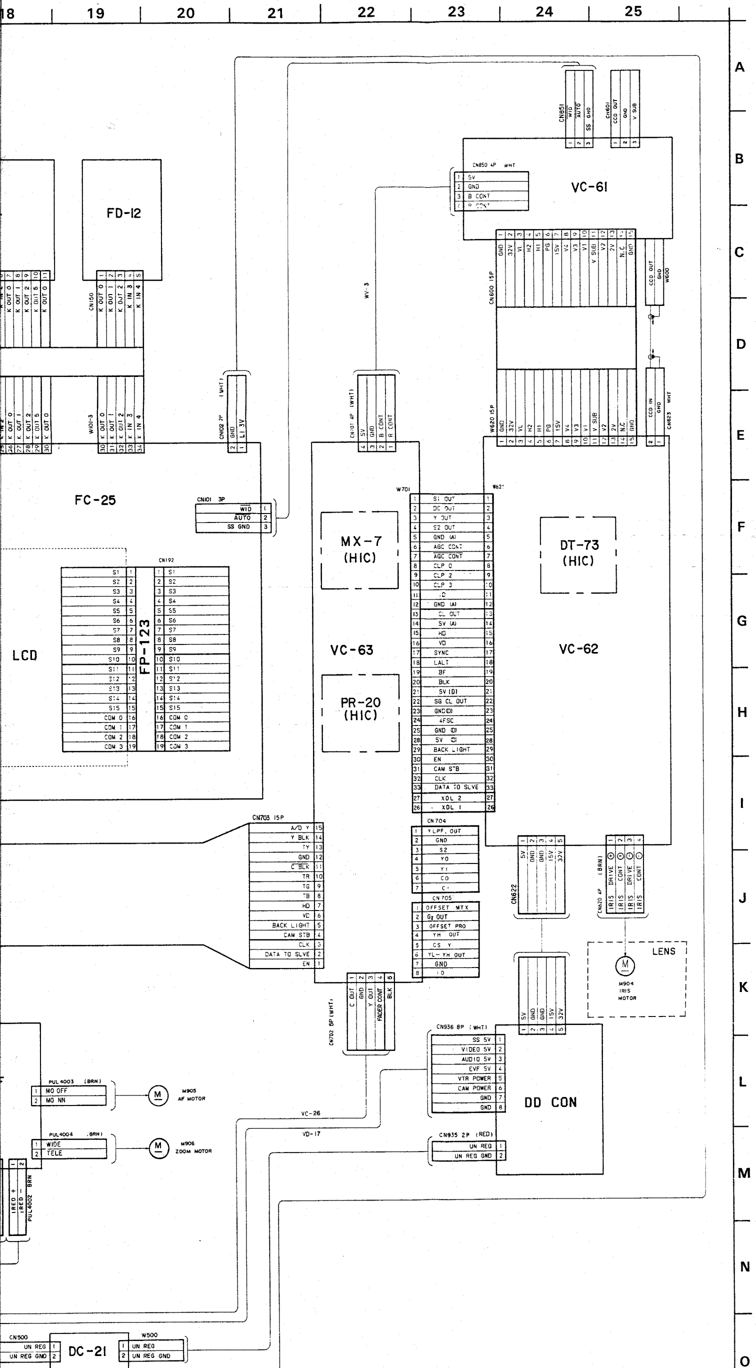
18
19
20
21
CC-7
M902 CAPSTAN MOTOR
M
FP-53
REC PROOF SW
ME/ MP
T/E SENS LED
GND
T/S FG LED
T FG
SS 5V
S FG
SS 5V
S301
TAPE SELECT SW
REC PROOF SW
D302 TAPE LED
EJ-9
W162
W161
K IN 2
K OUT 2
FV-4
FD-12
CN160
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K OUT 0
CN150
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
FP-118
FP-124
W101-2
W101-3
CN102 2P (WHT)
GND
LI 3V
FC-25
CN101 3P
WID
AUTO
SS GND
CN007
W101-1
SS GND
CAM STB
CAM REC
CAM STBY
CC DOWN
REF V (CAM)
CG STB
CS
SLVE RESET
DATA TO MSTR
DATA TO SLVE
CLK
EVER 5V
N.C
LINCS POWER
SS C 5V
FADER CONT
UN REG
N.C
VDD
CN192
LCD
FP-123
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
COM 0
COM 1
COM 2
COM 3
SLOW
RP PB MODE
ATF EHR
TALLY
TS B
ATF LOCK
A MUTE
CG 5V
FADER CONT
STB
CLK
DATA TO SLVE
VTR POWOR
SEL 16K/47K
V SO
V CS
V CK
EP GND
EP
J361
VIDEO OUT
RFU DC OUT
AUDIO OUT
J360
VIDEO IN
AUDIO IN
W004 15P
A/D Y
Y BLK
TY
GND
C BLK
TR
TG
TB
HD
VD
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
CN703 15P
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
W362 5P
BLK
FADER CONT
Y IN
V GND
C IN
CN005
WIDE
TELE
AF GND
AF CONT
SS C 5V
AF UNREG
UN REG GND
AS-78
CN4005 (BRN)
W SW
T SW
AF GND
AF CONT
SS C 5V
UN REG
UN REG GND
AF
PUL4003 (BRN)
MO OFF
MO NN
M905 AF MOTOR
PUL4004 (BRN)
WIDE
TELE
M906 ZOOM MOTOR
AF BLOCK UNIT
V +
A OUT
VD
B OUT
V −
IRED +
IRED −
PUL4001 WHT
PUL4002 BRN
VC-2
VD-1
W551 3P
MIC 5V
MIC OUT
MIC GND
J551
EXT MIC DC OUT
J550
EXT MIC
MC-36
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
CN551 3P
SS GND
CAM REC
CH GND
MIC UNIT
CN500
UN REG
UN REG GND
DC-21
W500
UN REG
UN REG GND
PD-19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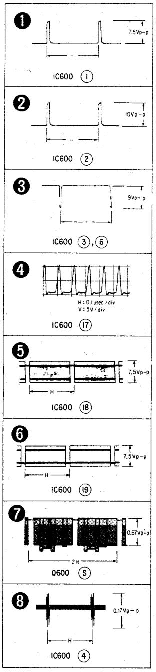
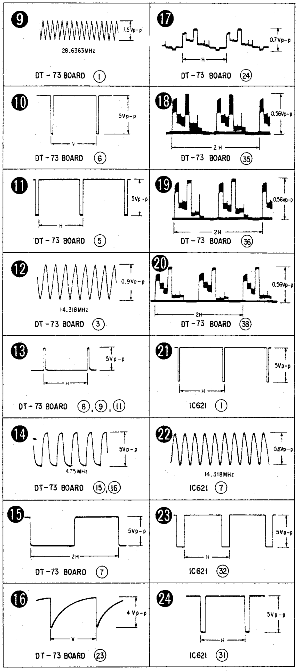
23
24
25
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
FD-12
CN150
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
W101-3
CN851
WID
AUTO
SS GND
CN601
CCD OUT
GND
V SUB
CN850 4P WHT
5V
GND
B CONT
R CONT
VC-61
CN600 15P
GND
32V
VL
H2
H1
PG
15V
V4
V3
V1
V SUB
V2
2V
N.C
W600
CCD OUT
CCD IN
CN623 WHT
W620 15P
WV-3
CN102 2P (WHT)
LI 3V
CN701 4P (WHT)
FC-25
CN101 3P
W701
W621
MX-7 (HIC)
DT-73 (HIC)
VC-63
VC-62
PR-20 (HIC)
LCD
FP-123
CN192
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
COM 0
COM 1
COM 2
COM 3
S1 OUT
DC OUT
Y OUT
S2 OUT
GND (A)
AGC CONT
CLP 0
CLP 2
CLP 3
GND (A)
CL OUT
5V (A)
HD
VD
SYNC
LALT
BF
BLK
5V (D)
SG CL OUT
GND(D)
4FSC
GND (D)
5V (D)
BACK LIGHT
EN
CAM STB
CLK
DATA TO SLVE
XDL 2
XDL 1
CN703 15P
A/D Y
Y BLK
TY
GND
C BLK
TR
TG
TB
HD
VD
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
CN704
YLPF. OUT
GND
S2
YO
Y1
CO
C1
CN705
OFFSET MTX
G1 OUT
OFFSET PRO
YH OUT
CS Y
YL-YH OUT
GND
CN622
5V
GND
15V
32V
CN620 4P (BRN)
IRIS DRIVE ⊕
IRIS CONT ⊕
IRIS DRIVE ⊖
IRIS CONT ⊖
LENS
M904 IRIS MOTOR
CN702 5P (WHT)
C OUT
Y OUT
FADER CONT
BLK
CN936 8P (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
DD CON
CN935 2P (RED)
UN REG
UN REG GND
VC-26
VD-17
PUL4003 (BRN)
MO OFF
MO NN
M905 AF MOTOR
PUL4004 (BRN)
WIDE
TELE
M906 ZOOM MOTOR
IRED +
IRED −
PUL4002 BRN
CN500
DC-21
W500

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

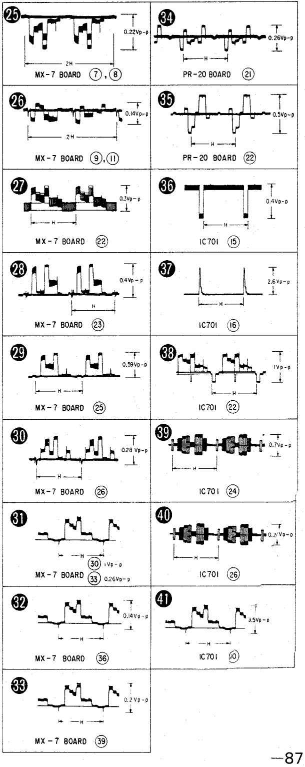
VC-61 BOARD



VC-62 BOARD



VC-63 BOARD



D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1

**THIS NOTE IS COMMON FOR
AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessa**

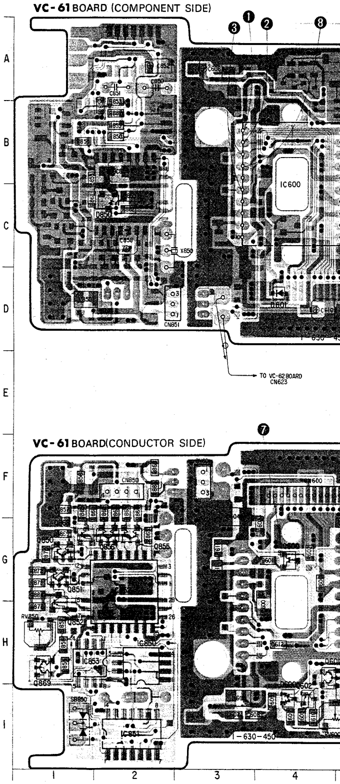
- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enabl
- : Pattern of the rear side.
- Circled numbers refer to waveforms.

Caution:
Pattern face side: Parts on the pattern
(Conductor Side) the pattern face are in
Parts face side: Parts on the parts f
(Component Side) the parts face are indic

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after remo
  Be careful not to heat the minus si
  because it is damaged by the heat.
- All resistors are in ohms, 1/10W unle
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwis
  50V or less are not indicated except f
  tantalums.
- All variable and adjustable resistors h
  unless otherwise noted.

VC-61 (CCD IMAGER), VC-62 (TIMING/SYNC GENERATOR)

—Ref. No. VC-61, VC-62, VC-63, DC-21 BOARDS; 1,000 series—


VC-61 BOARD (COMPONENT SIDE)
VC-61 BOARD(CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
1
2
3
4
IC600
X850
CN851
TO VC-62 BOARD CN623
CN850
Q855
Q856
Q851
Q852
Q869
IC850
IC851
IC853
RV850
SB850
1-630-450

IS COMMON FOR PRINTED WIRING BOARDS ATIC DIAGRAMS.

o this, the necessary note is printed in each block.)

ing boards.

hole.

rom the side which enables seeing.

f the rear side.

s refer to waveforms.

: Parts on the pattern face side seen from
) the pattern face are indicated.
Parts on the parts face side seen from
e) the parts face are indicated.

diagram.

replacing chip parts.

st be attached after removal of chip.

ot to heat the minus side of tantalum capacitor, amaged by the heat.

re in ohms, 1/10W unless otherwise noted. MΩ: 1000kΩ.

are in μF unless otherwise noted. pF : μμF.

e not indicated except for electrolytics and

nd adjustable resistors have characteristic curve B, se noted.

- : nonflammable resistor.
- : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.
- ▬ : B + Line
- ⇨ : IN/OUT direction of (+, −) B line.
- Circled numbers refer to waveforms.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

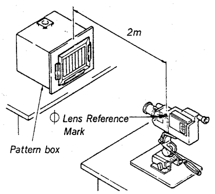
When indicating parts by reference number, please include the board name.

- **For voltage and waveforms.**

CAMERA (1), CAMERA (2), AUTO FOCUS, DIGITAL TITLER BLOCKS

- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and th the output waveform of Fig. a and the can be obtain.

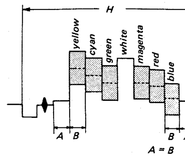

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A = B

Fig. a Camera output waveform of J361 on VA-42 board

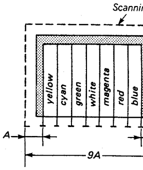
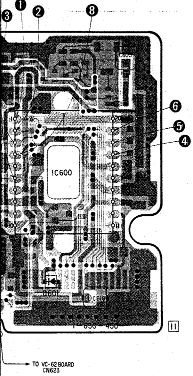
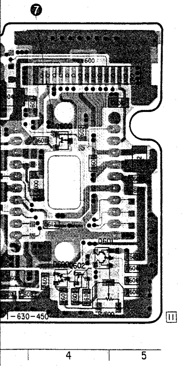

Scanni
yellow
cyan
green
white
magenta
red
blue
A
9A

Fig. b Picture of TV monitor s

SYNC GENERATOR), VC-63 (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21 (RELAY) PRINTED WIRING BOARDS

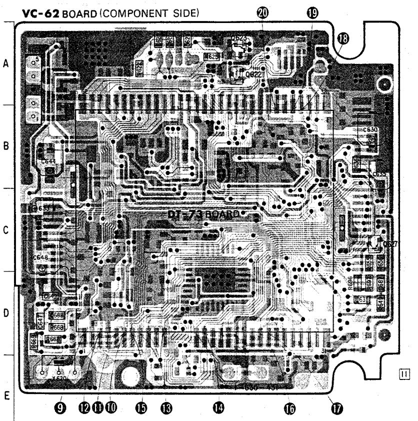
RDS ; 1,000 series—


❸
❶
❷
❽
❻
❺
❹
IC600
1-630-450
II
TO VC-62 BOARD CN623

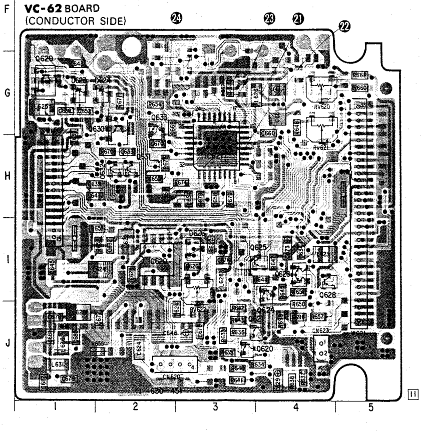

❼
1-630-450
II
4
5

D623	G-1
D624	G-2
D626	I-3
IC620	I-2
IC621	H-3
Q620	J-4
Q621	J-4
Q622	A-3
Q623	A-3
Q624	H-4
Q625	I-4
Q626	I-4
Q627	C-5
Q628	I-4
Q629	G-1
Q630	G-2
Q631	H-2
Q632	H-2
Q633	G-2

VC-62 BOARD (COMPONENT SIDE)

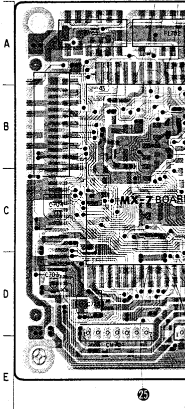

⑳
⑲
⑱
A
B
C
D
E
DT-73 BOARD
1-630-451
II
⑨
⑫
⑪
⑩
⑮
⑬
⑭
⑯
⑰

VC-62 BOARD (CONDUCTOR SIDE)

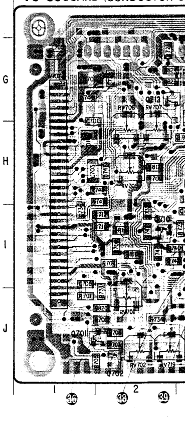

㉔
㉓
㉑
㉒
F
G
H
I
J
CN620
CN623
1-630-451
II
1
2
3
4
5

IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

VC-63 BOARD (COMPONENT SIDE)


㉝
㉜
A
B
C
D
E
MX-7 BOAR
㉕

VC-63 BOARD (CONDUCTOR S


F
G
H
I
J
1
2
㊱
㊳
㊴

)

2. **Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.**

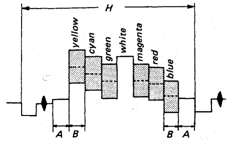

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Camera output waveform of J361 on VA-42 board

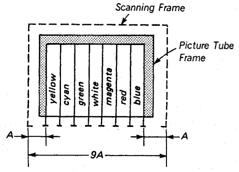
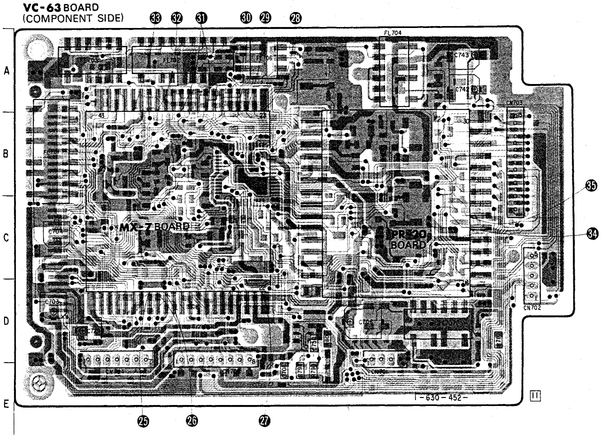

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

VIDEO/AUDIO SERVO/SYSTEM CONTROL, MODE CONTROL, VIEWFINDER BLOCKS

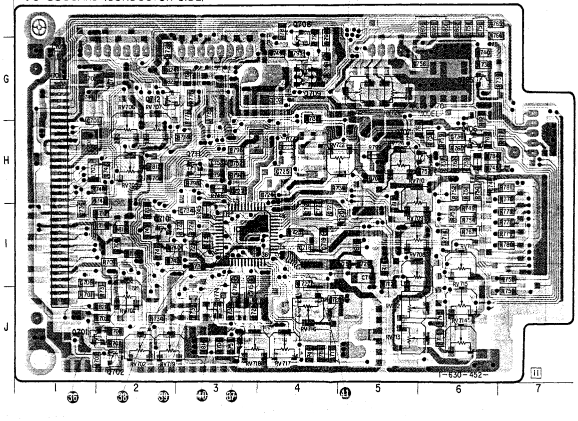
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

VC-63 BOARD (COMPONENT SIDE)


㉝
㉜
㉛
㉚
㉙
㉘
A
B
C
D
E
FL704
C743
C742
CN703
MX-7 BOARD
PR-20 BOARD
CN702
㉟
㉞
1-630-452-
11
㉕
㉖
㉗

IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

VC-63 BOARD (CONDUCTOR SIDE)


F
G
H
I
J
Q708
Q709
Q711
Q701
Q702
RV701
RV702
RV705
RV706
RV707
RV709
RV710
RV711
RV713
RV714
RV715
RV716
RV717
RV718
RV719
1-630-452-
11
1
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3
4
5
6
7
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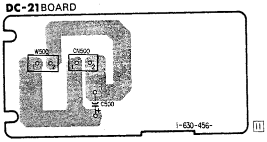
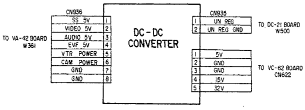
㊳
㊴
㊵
㊲
㊶

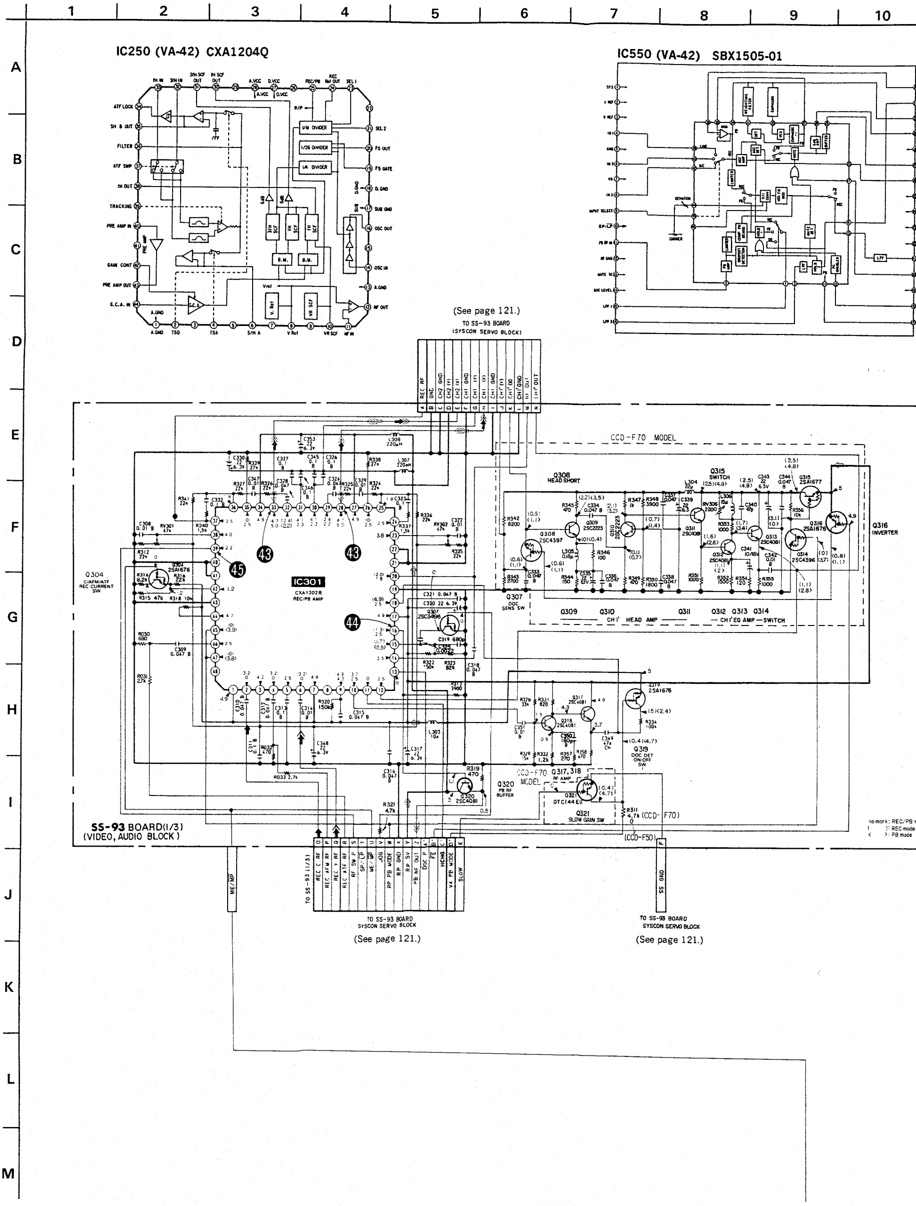
DC-21 BOARD


W500
CN500
C500
1-630-456-
11


CN936
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
TO VA-42 BOARD W361
DC-DC CONVERTER
CN935
UN REG
UN REG GND
TO DC-21 BOARD W500
5V
GND
GND
15V
32V
TO VC-62 BOARD CN622

SS-93 (REC/PB AMP), VA-42 (VIDEO/AUDIO SIGNAL PROESS), MC-36 (MIC AMP, START/STOP SWITCH) SCHEMATIC DIAGRAM

—Ref. No. SS-93, VA-42, MC-36 BOARDS ; 2,000 series—



1
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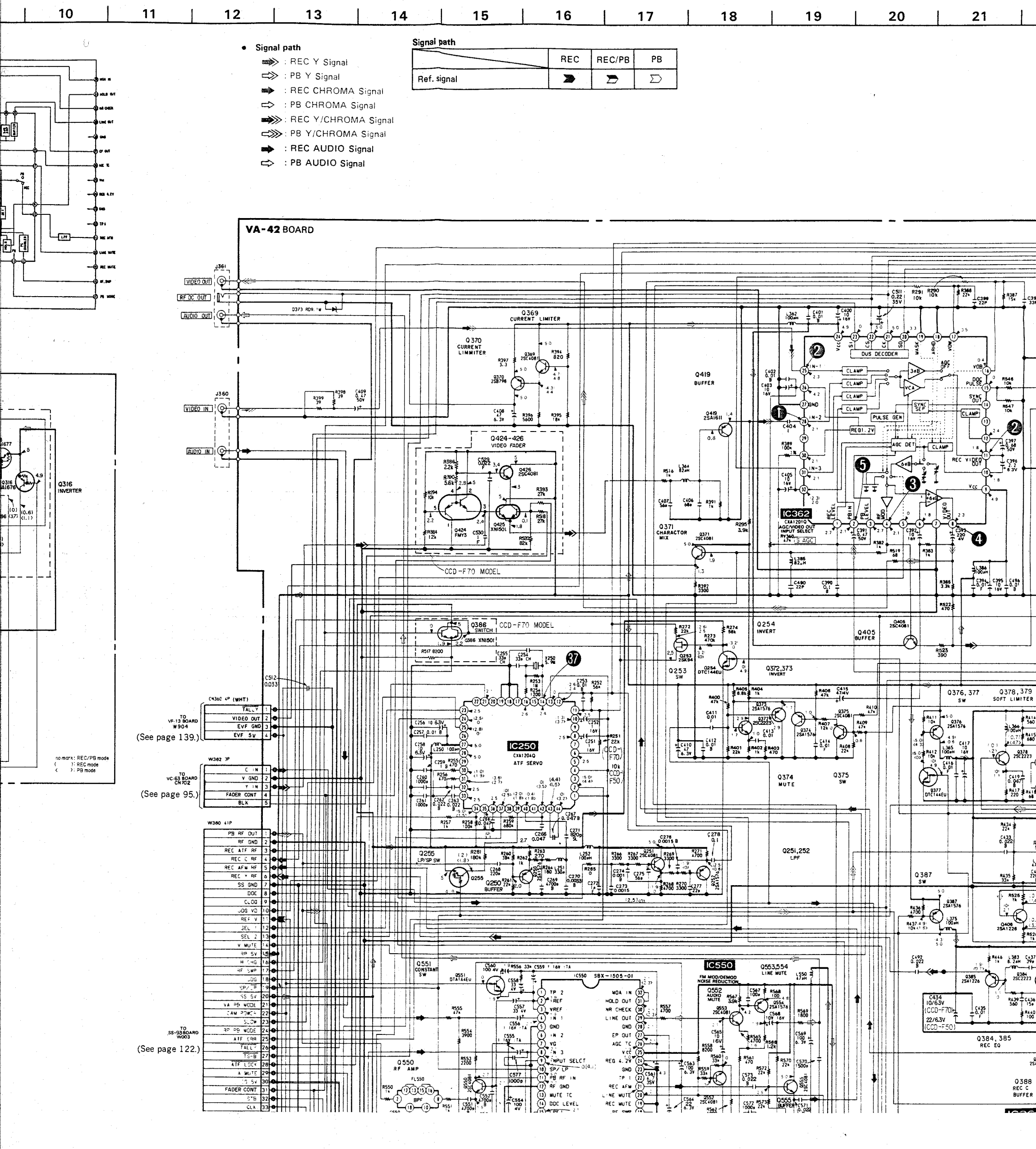
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
IC250 (VA-42) CXA1204Q
IC550 (VA-42) SBX1505-01
(See page 121.)
TO SS-93 BOARD
(SYSCON SERVO BLOCK)
REC RF
GND
CH2 GND
CH2 (Y)
CH2 (X)
CH1 GND
CH1 (Y)
CH1 (X)
CH1 GND
CH1' (Y)
CH1' (X)
CH1' GND
H' OUT
CH1' OUT
CCD-F70 MODEL
Q308
HEAD SHORT
Q315
SWITCH
Q316
INVERTER
IC301
CXA1202R
REC/PB AMP
43
43
44
45
Q304
C/AFM/ATF
REC CURRENT
SW
Q307
DOC
SENS SW
Q309
Q310
Q311
CH1' HEAD AMP
Q312
Q313
Q314
CH1' EQ AMP — SWITCH
Q319
DOC DET
ON/OFF
SW
Q320
PB RF
BUFFER
CCD-F70 Q317, 318
MODEL
RF AMP
Q321
DTC144EU
Q321
SLOW GAIN SW
(CCD-F70)
(CCD-F50)
SS-93 BOARD(1/3)
(VIDEO, AUDIO BLOCK)
ME/MP
TO SS-93 (1/3)
REC C RF
REC AFM RF
REC ATF RF
RF SW P
SP/LP
ME/MP
JOG
RP PB MODE
RP GND
RP 5V
PB RF OUT
DOC P
HCHG
VA PB MODE
SLOW
TO SS-93 BOARD
SYSCON SERVO BLOCK
(See page 121.)
SS GND
TO SS-93 BOARD
SYSCON SERVO BLOCK
(See page 121.)
no mark : REC/PB
( ) : REC mode
< > : PB mode


10
11
12
13
14
15
16
17
18
19
20
21
VA-42 BOARD
VIDEO OUT
RF DC OUT
AUDIO OUT
VIDEO IN
AUDIO IN
J361
J360
Q369 CURRENT LIMITER
Q370 CURRENT LIMMITER
Q424-426 VIDEO FADER
CCD-F70 MODEL
Q419 BUFFER
Q371 CHARACTOR MIX
IC362 CXA1201Q AGC/VIDEO OUT INPUT SELECT
DUS DECODER
CLAMP
PULSE GEN
AGC DET
SYNC SEP
REC VIDEO OUT
Q316 INVERTER
Q386 SWITCH
IC250 CXA1204Q ATF SERVO
Q254 INVERT
Q405 BUFFER
Q253 SW
Q372,373 INVERT
Q374 MUTE
Q375 SW
Q376, 377 SW
Q378, 379 SOFT LIMITER
Q255 LP/SP SW
Q250 BUFFER
Q251,252 LPF
Q387 SW
Q384, 385 REC EQ
Q388 REC C BUFFER
Q551 CONSTANT SW
Q550 RF AMP
IC550 SBX-1505-01
IC550 FM MOD/DEMOD NOISE REDUCTION
Q553,554 LINE MUTE
Q552 AUDIO MUTE
Q555 BUFFER
CN360 4P (WHT)
TO VF-13 BOARD W904
(See page 139.)
W362 3P
TO VC-63 BOARD CN702
(See page 95.)
W380 41P
TO SS-93BOARD W003
(See page 122.)
no mark: REC/PB mode
( ): REC mode
< >: PB mode

- Signal path
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

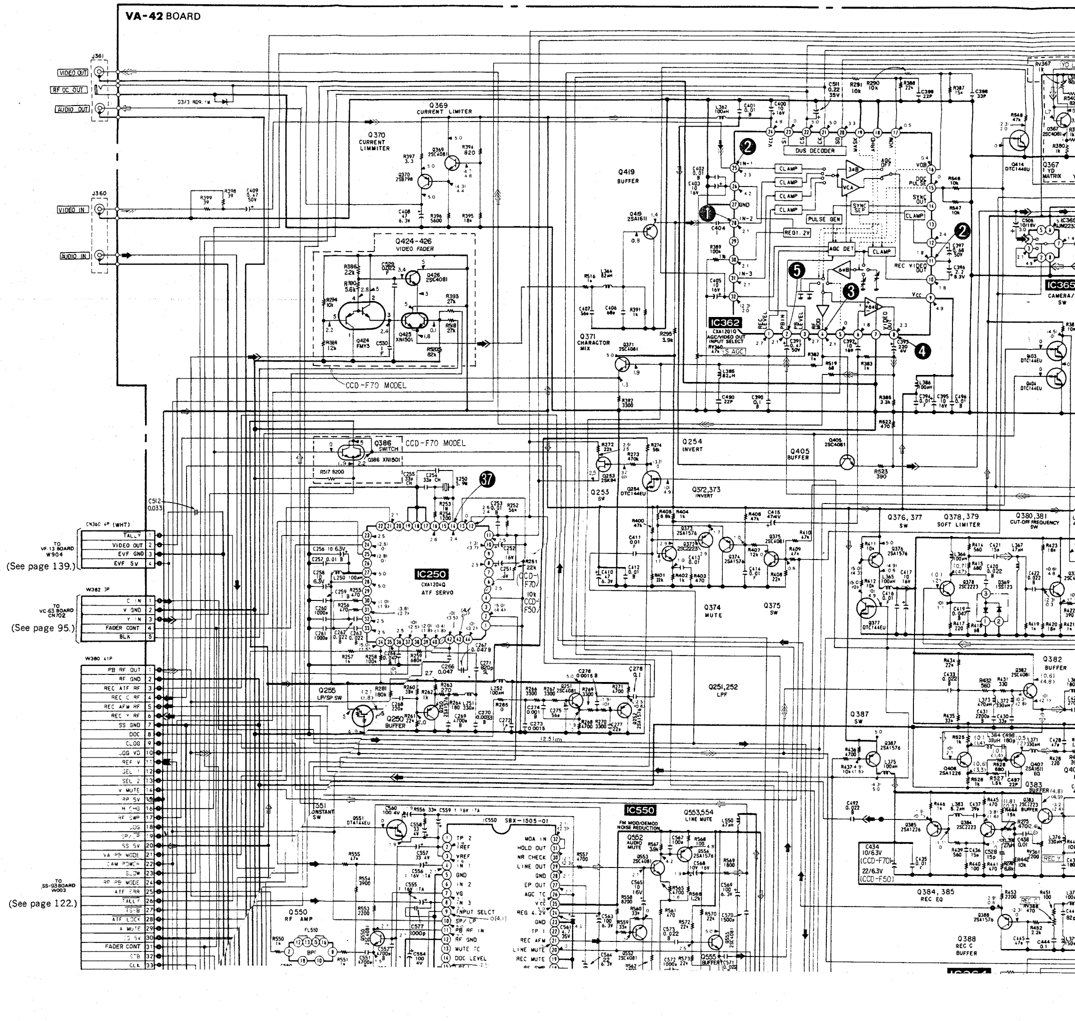
Signal path

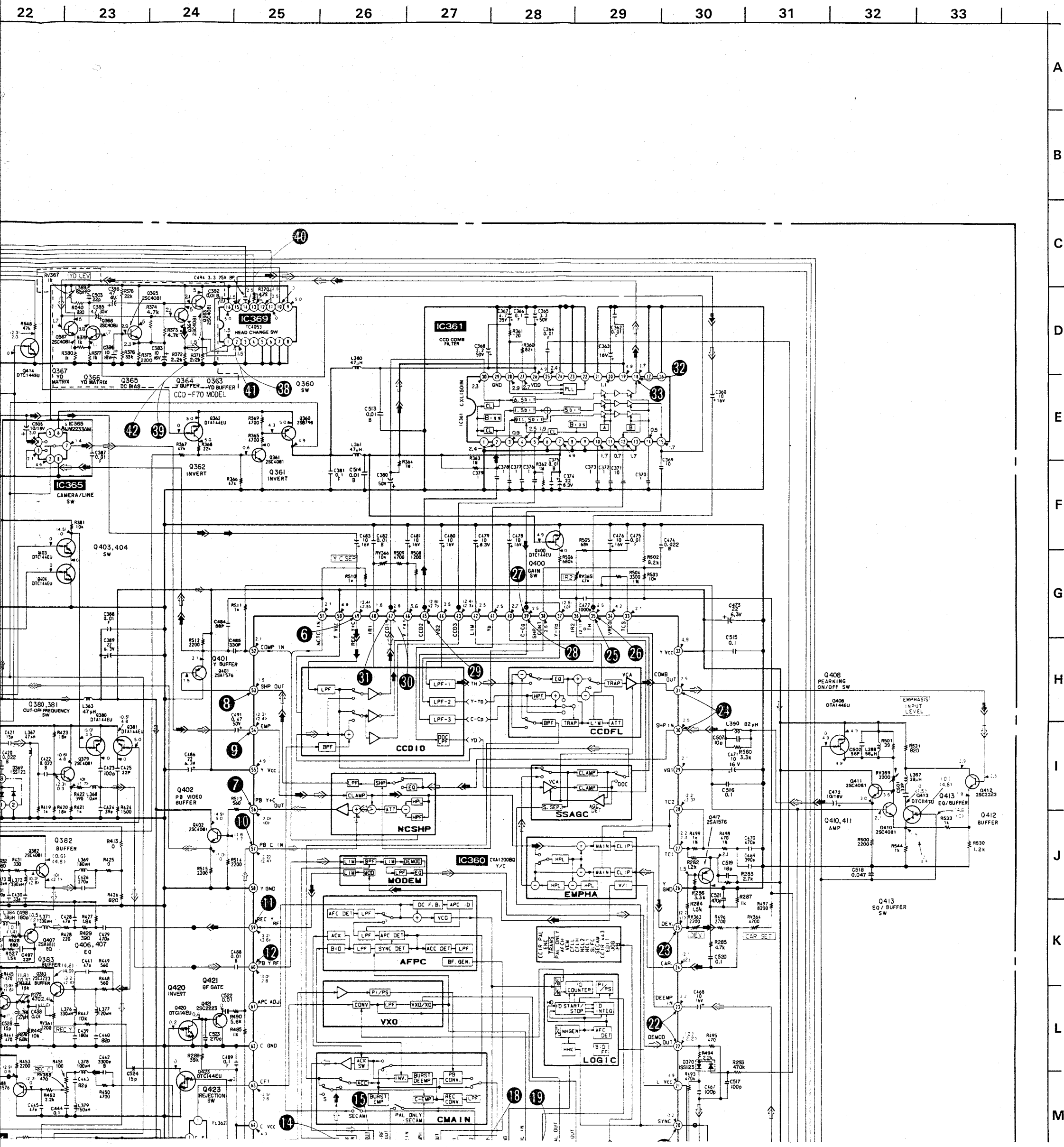
	REC	REC/PB	PB
Ref. signal	➡	➡	⇨

11 12 13 14 15 16 17 18 19 20 21 22

- **Signal path**
  - ⇛ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ⇛ : REC Y/CHROMA Signal
  - ⇛ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

Signal path	REC	REC/PB	PB
Ref. signal	➡	⇛	▷


VA-42 BOARD
J361
VIDEO OUT
RF DC OUT
AUDIO OUT
J360
VIDEO IN
AUDIO IN
Q369 CURRENT LIMITER
Q370 CURRENT LIMMITER
Q424-426 VIDEO FADER
CCD-F70 MODEL
Q419 BUFFER
IC362 CXA1201Q AGC/VIDEO OUT INPUT SELECT
DUS DECODER
CLAMP
PULSE GEN
AGC DET
REG1.2V
REC VIDEO OUT
Q371 CHARACTOR MIX
Q386 SWITCH
CCD-F70 MODEL
IC250 CXA1204Q ATF SERVO
Q254 INVERT
Q405 BUFFER
Q253 SW
Q372,373 INVERT
Q374 MUTE
Q375 SW
Q376,377 SW
Q378,379 SOFT LIMITER
Q380,381 CUT-OFF FREQUENCY SW
Q382 BUFFER
Q387 SW
Q383 BUFFER
Q384,385 REC EQ
Q388 REC C BUFFER
Q255 LP/SP SW
Q250 BUFFER
Q251,252 LPF
Q367 YD MATRIX
IC365 CAMERA/ SW
Q403
Q404
CN360 4P (WHT)
TALLY
VIDEO OUT
EVF GND
EVF 5V
TO VF-13 BOARD W904
(See page 139.)
W362 3P
C IN
V GND
Y IN
FADER CONT
BLK
TO VC-63 BOARD CN702
(See page 95.)
W380 41P
PB RF OUT
RF GND
REC ATF RF
REC C RF
REC AFM RF
REC Y RF
SS GND
DOC
CLOG
JOG VD
REF V
SEL 1
SEL 2
V MUTE
RP 5V
H CHG
RF SWP
JOG
SP/LP
SS 5V
VA PB MODE
CAM POWER
SLOW
RP PB MODE
ATF ERR
TALLY
TS-B
ATF LOCK
A MUTE
SS 5V
FADER CONT
STB
CLK
TO SS-93 BOARD W003
(See page 122.)
Q550 RF AMP
Q551 CONSTANT SW
IC550 SBX-1505-01
MOA IN
HOLD OUT
NR CHECK
LINE OUT
GND
EP OUT
AGC TC
VCC
REG 4.2V
TP 1
REC AFM
LINE MUTE
REC MUTE
TP 2
REF
VREF
IN 1
GND
IN 2
VG
IN 3
INPUT SELCT
SP/LP
PB RF IN
RF GND
MUTE TC
DOC LEVEL
IC550 FM MOD/DEMOD NOISE REDUCTION
Q552 AUDIO MUTE
Q553,554 LINE MUTE
Q555 BUFFER
C434 10/63V (CCD-F70) 22/63V (CCD-F50)


22
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A
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G
H
I
J
K
L
M
IC369
TC4053
HEAD CHANGE SW
IC361
CCD COMB FILTER
IC361 CXL1501M
PLL
IC365
NJM2233AM
IC365
CAMERA/LINE SW
IC360
CXA1200BQ
Y/C
YD LEV
RV367
Q367
YD MATRIX
Q366
YD MATRIX
Q365
DC BIAS
Q364
Y BUFFER
Q363
YD BUFFER
CCD-F70 MODEL
Q360
SW
Q362
INVERT
Q361
INVERT
Q414
DTC144EU
Q403,404
SW
Q380,381
CUT-OFF FREQUENCY SW
Q382
BUFFER
Q383
BUFFER
Q406,407
EQ
Q401
Y BUFFER
2SA1576
Q402
PB VIDEO BUFFER
2SC4081
Q400
GAIN SW
DTC144EU
Q420
INVERT
DTC114EU
Q421
BF GATE
2SC2223
Q423
REJECTION SW
DTC144EU
Q417
2SA1576
Q408
PEARKING ON/OFF SW
DTA144EU
Q410,411
AMP
2SC4081
Q413
EQ/BUFFER
DTC114TU
Q412
BUFFER
2SC2223
Q413
EQ/BUFFER SW
EMPHASIS INPUT LEVEL
DEV.
CAR SET
REC Y
Y C SEP
CCD10
LPF
BPF
LPF-1
LPF-2
LPF-3
DOC LPF
TH
Y-YD
C-CD
YD
CCDFL
EQ
HPF
TRAP
VCA
LIM
ATT
NCSHP
SHP
CLAMP
SSAGC
S.SEP
AGC DET
DOC
EMPHA
MAIN
CLIP
V/I
MODEM
DEMOD
MOD
AFPC
AFC DET
DC F.B.
APC ID
VCO
ACK
B.ID
SYNC DET
ACC DET
BF. GEN.
VXO
P1/PS
CONV
VXO/XO
CMAIN
ACK SW
ACC
INV.
BURST DEEMP
PB CONV.
BURST EMP
C-EMP
REC CONV.
SECAM
PAL ONLY
LOGIC
COUNTER
START/STOP
INTEG
NMGEN
AFC DET
COMP IN
SHP OUT
EMP
Y VCC
PB Y+C OUT
PB C IN
Y GND
REC Y RF
PB Y RF
APC ADJ
C GND
CF1
C VCC
COMB OUT
SHP IN
VG1
TC2
TC1
Y GND
DEV.
CAR
DEEMP IN
DEMOD OUT
L VCC
SYNC
FL362
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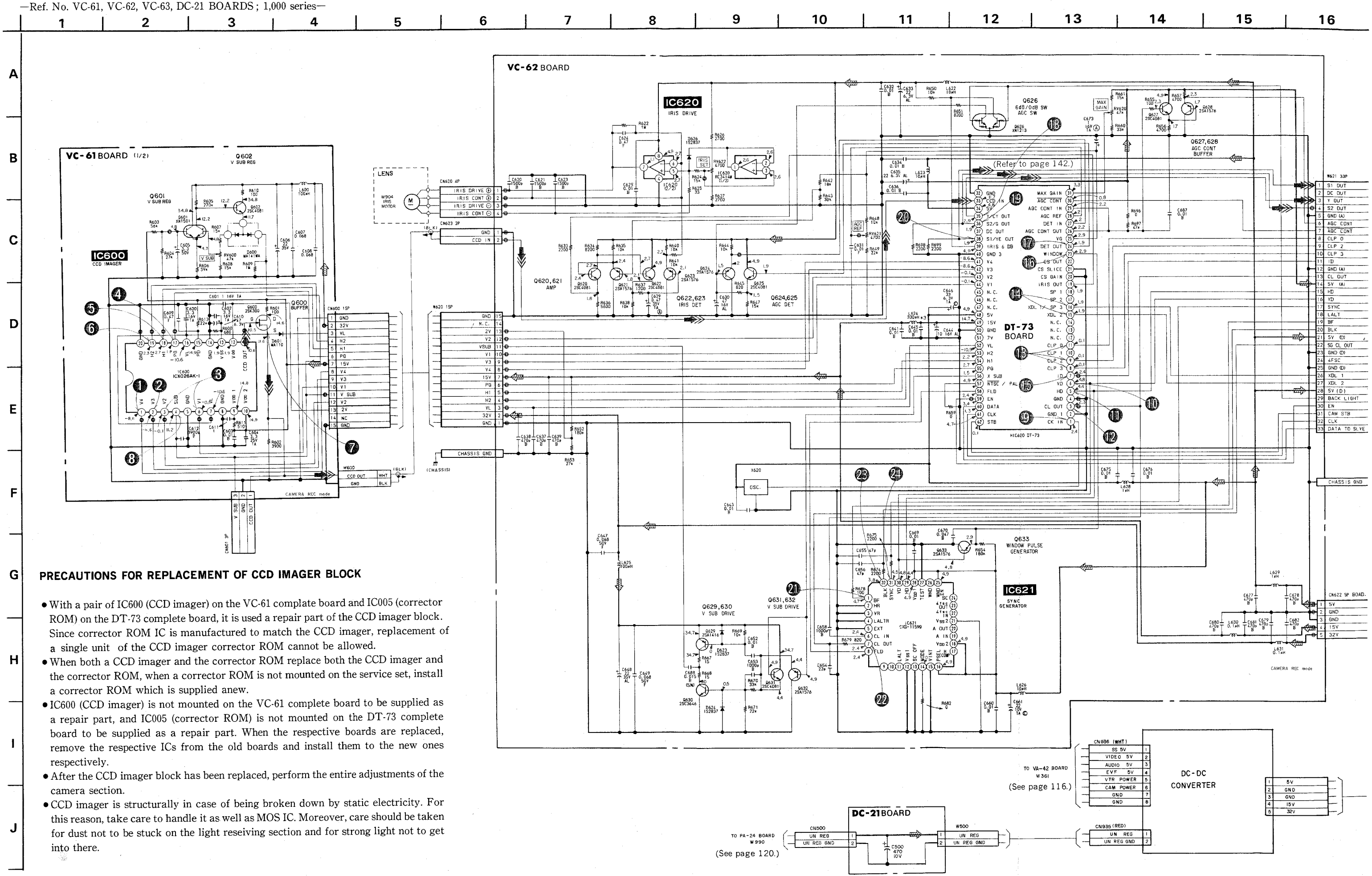
VC-61 (CCD IMAGER), VC-62 (TIMING/SYNC GENERATOR), VC-63 (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21 (RELAY) SCHEMATIC DIAGRAM

—Ref. No. VC-61, VC-62, VC-63, DC-21 BOARDS ; 1,000 series—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13
14
15
16
A
B
C
D
E
F
G
H
I
J
VC-61 BOARD (1/2)
Q602 V SUB REG
Q601 V SUB REG
IC600 CCD IMAGER
IC600 ICX026AK-1
Q600 BUFFER
CN600 15P
GND
32V
VL
H2
H1
PG
15V
V4
V3
V1
V SUB
V2
2V
NC
GND
W600
CCD OUT
GND
WHT
BLK
CAMERA REC mode
CN601 3P
V SUB
GND
CCD OUT
LENS
M904 IRIS MOTOR
CN620 4P
IRIS DRIVE ⊕
IRIS CONT ⊕
IRIS DRIVE ⊖
IRIS CONT ⊖
CN623 2P
GND
CCD IN
W620 15P
N.C.
VSUB
CHASSIS GND
(CHASSIS)
VC-62 BOARD
IC620 IRIS DRIVE
Q620,621 AMP
Q622,623 IRIS DET
Q624,625 AGC DET
Q626 6dB/0dB SW AGC SW
Q627,628 AGC CONT BUFFER
MAX GAIN
AGC REF
IRIS SET
(Refer to page 142.)
GND
CCD IN
5V
Y/CY OUT
S2/G OUT
DC OUT
S1/YE OUT
IRIS 6 DB
GND 3
V4
V3
V2
V1
N.C.
N.C.
N.C.
5V
15V
GND
7V
VL
H2
H1
PG
X SUB
NTSC / PAL
FLD
EN
DATA
CLK
STB
MAX GAIN
AGC CONT
AGC CONT IN
AGC REF
DET IN
AGC CONT OUT
VG
DET OUT
WINDOW
CS OUT
CS SLICE
CS GAIN
IRIS OUT
SP 1
SP 2
XDL 1/ SP 3
XDL 2
N.C.
N.C.
N.C.
CLP 0
CLP 1
CLP 2
CLP 3
ID
VD
HD
GND
CL OUT
GND 1
CK IN
DT-73 BOARD
HIC620 DT-73
W621 33P
S1 OUT
DC OUT
Y OUT
S2 OUT
GND (A)
AGC CONT
AGC CONT
CLP 0
CLP 2
CLP 3
ID
GND (A)
CL OUT
5V (A)
HD
VD
SYNC
LALT
BF
BLK
5V (D)
SG CL OUT
GND (D)
4FSC
GND (D)
XDL 1
XDL 2
5V (D)
BACK LIGHT
EN
CAM STB
CLK
DATA TO SLVE
CHASSIS GND
X620
OSC.
Q633 WINDOW PULSE GENERATOR
IC621 SYNC GENERATOR
IC621 CXD-1159Q
Q629,630 V SUB DRIVE
Q631,632 V SUB DRIVE
CN622 5P BOARD.
5V
GND
GND
15V
32V
CAMERA REC mode
CN936 (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
TO VA-42 BOARD W361
(See page 116.)
DC-DC CONVERTER
5V
GND
GND
15V
32V
CN935 (RED)
UN REG
UN REG GND
DC-21 BOARD
CN500
UN REG
UN REG GND
W500
UN REG
UN REG GND
C500 470 10V
TO PA-24 BOARD W990
(See page 120.)
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
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⑱
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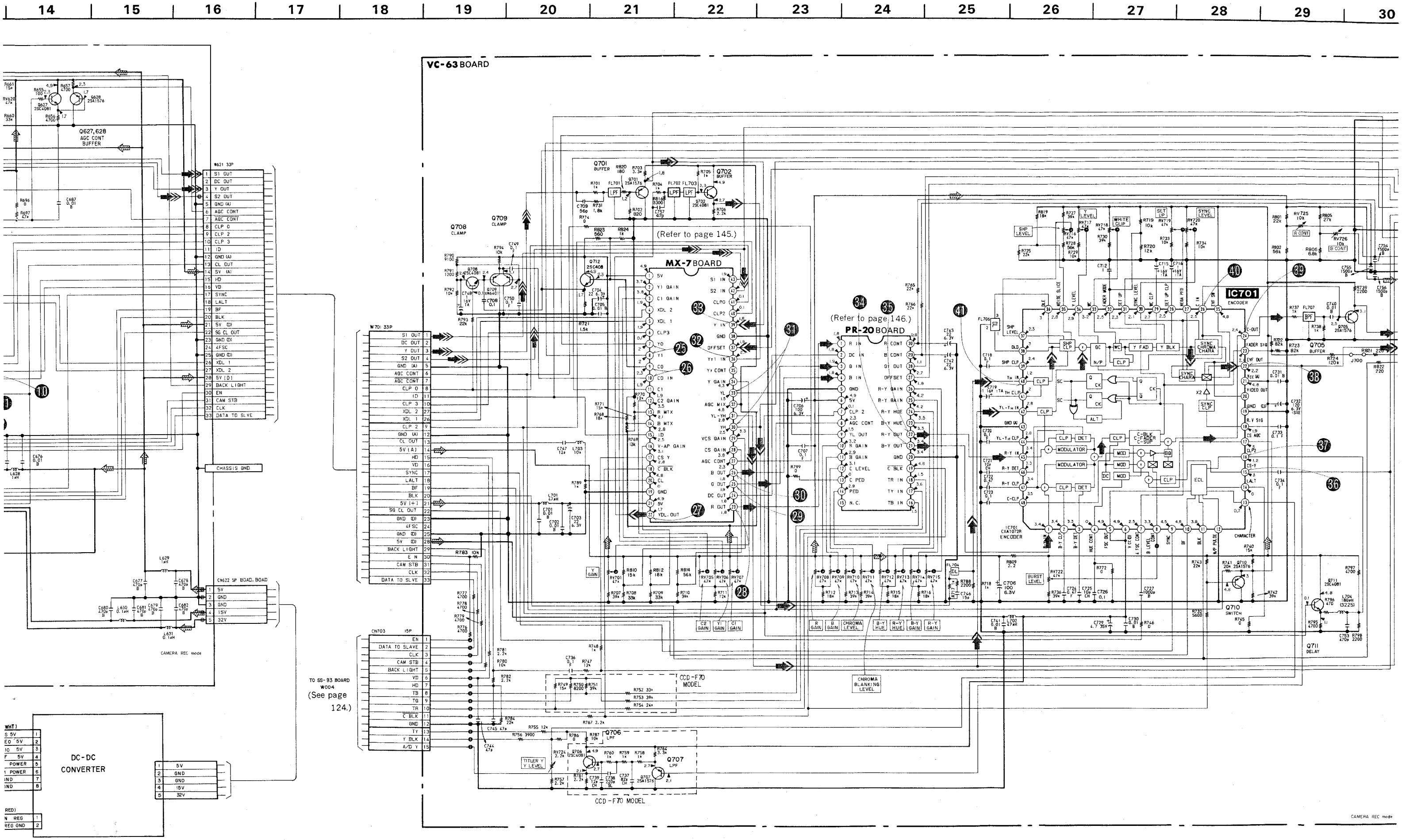
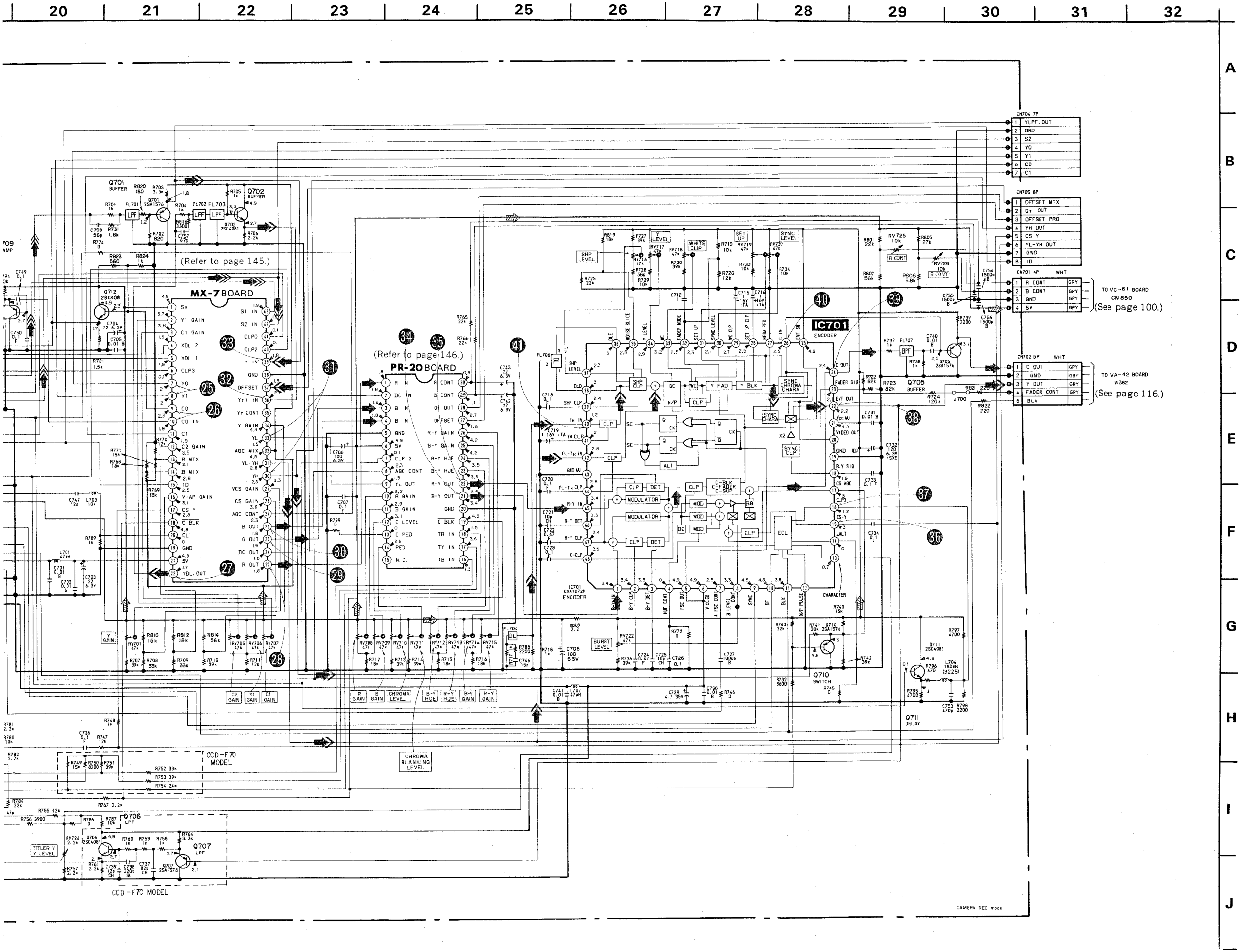
㉔

PRECAUTIONS FOR REPLACEMENT OF CCD IMAGER BLOCK

- With a pair of IC600 (CCD imager) on the VC-61 complate board and IC005 (corrector ROM) on the DT-73 complete board, it is used a repair part of the CCD imager block. Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC600 (CCD imager) is not mounted on the VC-61 complete board to be supplied as a repair part, and IC005 (corrector ROM) is not mounted on the DT-73 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new ones respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity. For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.


14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
VC-63 BOARD
Q627,628 AGC CONT BUFFER
W621 33P
CHASSIS GND
CN622 5P BOAD. BOAD
CAMERA REC mode
DC-DC CONVERTER
W701 33P
CN703 15P
TO SS-93 BOARD W004 (See page 124.)
Q701 BUFFER
Q702 BUFFER
Q708 CLAMP
Q709 CLAMP
(Refer to page 145.)
MX-7 BOARD
(Refer to page 146.)
PR-20 BOARD
IC701 ENCODER
IC701 CXA1072R ENCODER
Q705 BUFFER
Q710 SWITCH
Q711 DELAY
CCD-F70 MODEL
Q706 LPF
Q707 LPF
TITLER Y Y LEVEL
CHROMA BLANKING LEVEL
SHP LEVEL
Y LEVEL
WHITE CLIP
SET UP
SYNC LEVEL
R CONT
B CONT
BURST LEVEL
C2 GAIN
Y1 GAIN
C1 GAIN
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
Y GAIN
CAMERA REC mode

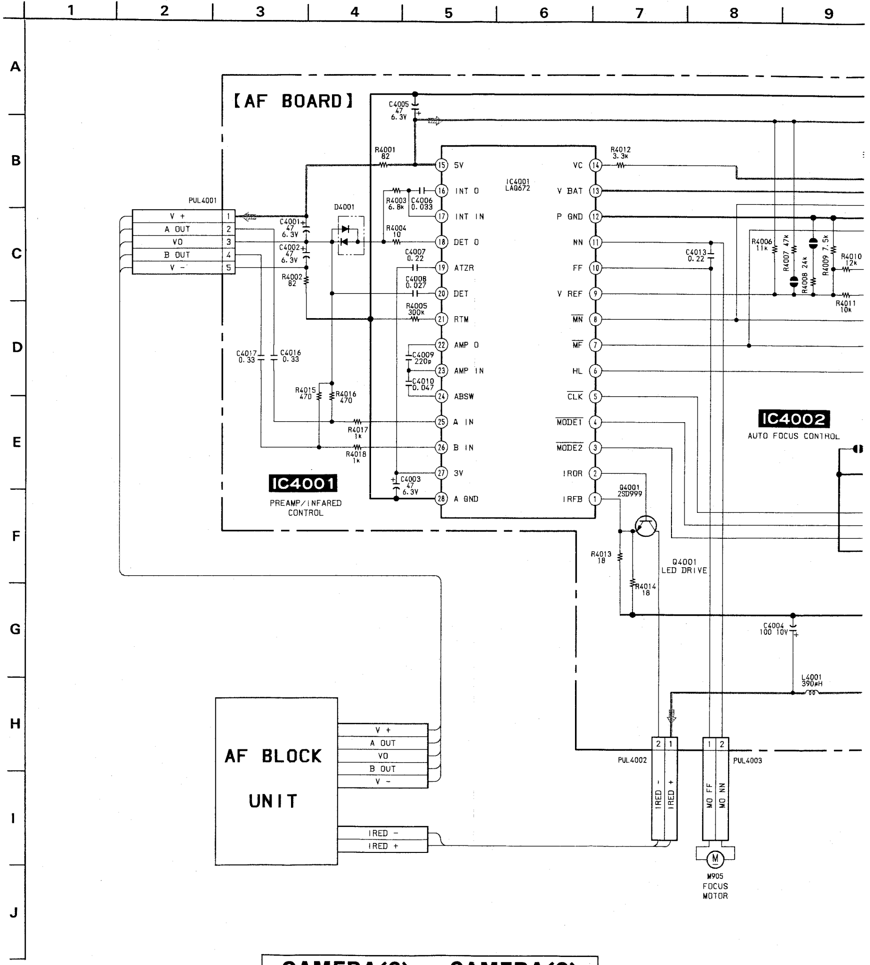

20
21
22
23
24
25
26
27
28
29
30
31
32
A
B
C
D
E
F
G
H
I
J
MX-7 BOARD
(Refer to page 145.)
PR-20 BOARD
(Refer to page 146.)
IC701
ENCODER
IC701 CXA1072R ENCODER
Q701 BUFFER
Q702 BUFFER
Q712 2SC408
Q705 BUFFER
Q710 SWITCH
Q711 DELAY
Q706 LPF
Q707 LPF
CN704 7P
YLPF. OUT
GND
S2
Y0
Y1
C0
C1
CN705 8P
OFFSET MTX
G OUT
OFFSET PRO
YH OUT
CS Y
YL-YH OUT
GND
ID
CN701 4P WHT
R CONT
B CONT
GND
5V
TO VC-61 BOARD CN860
(See page 100.)
CN702 5P WHT
C OUT
GND
Y OUT
FADER CONT
BLK
TO VA-42 BOARD W362
(See page 116.)
CCD-F70 MODEL
TITLER Y Y LEVEL
Y GAIN
C2 GAIN
Y1 GAIN
C1 GAIN
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
CHROMA BLANKING LEVEL
BURST LEVEL
SHP LEVEL
Y LEVEL
WHITE CLIP
SET UP
SYNC LEVEL
R CONT
B CONT
CAMERA REC mode

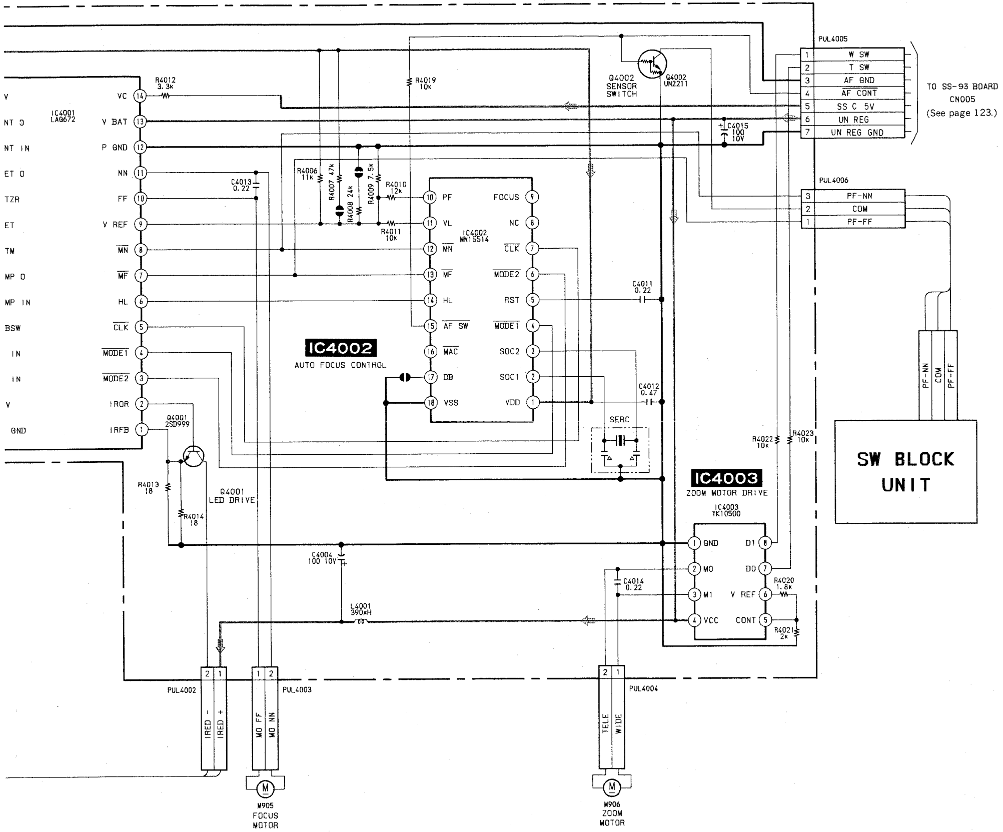
- Signal path
  - ➡ : REC Y Signal
  - ➡ : REC Y/CHROMA Signal
  - ➡ : REC CHROMA Signal

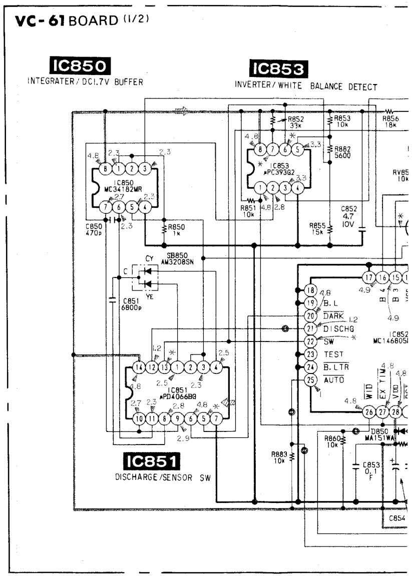
CAMERA(1)

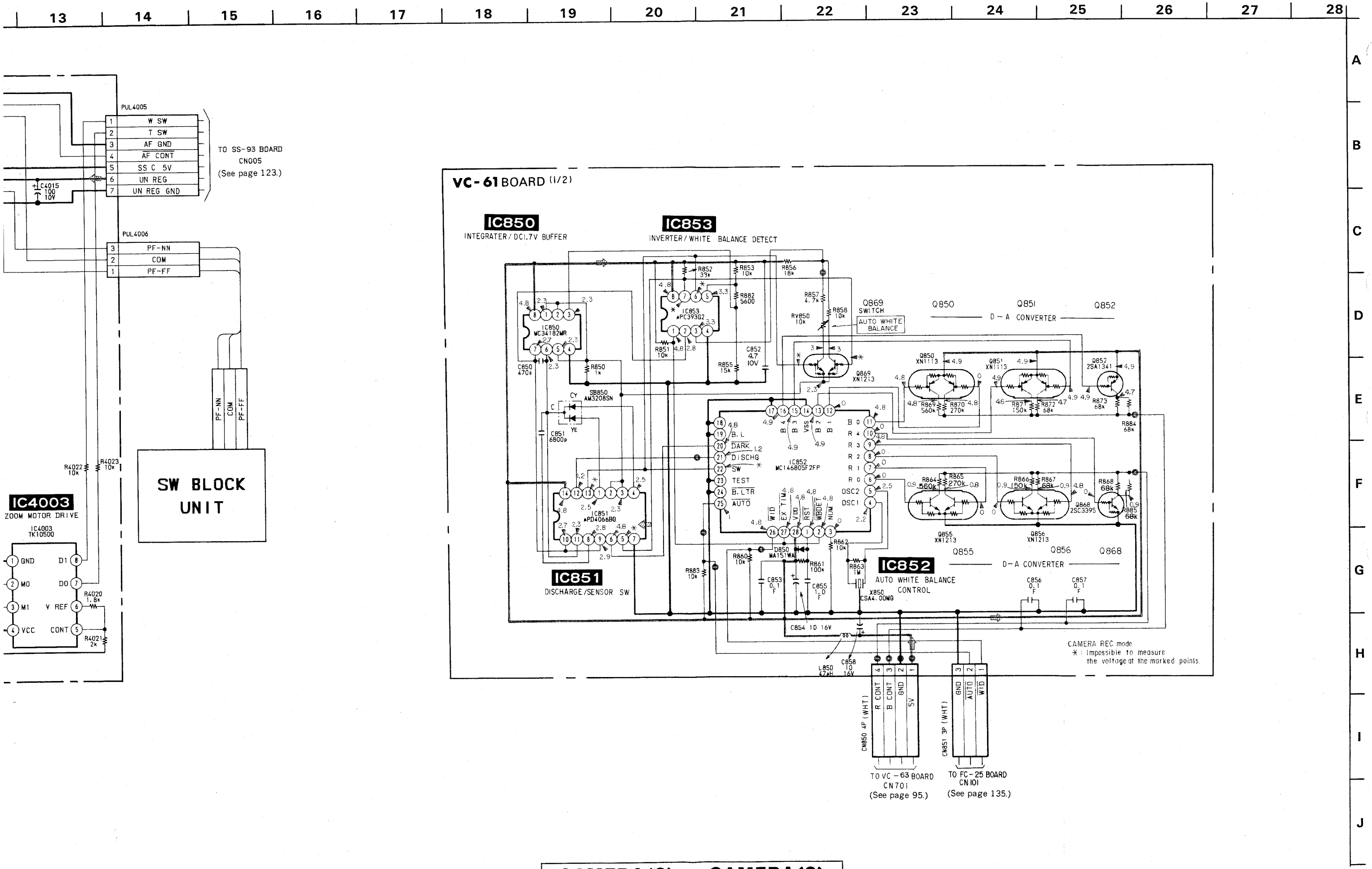
VC-61 (AUTO WHITE BALANCE) SCHEMATIC DIAGRAM

—Ref. No. VC-61 BOARD ; 1,000 series—


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
[AF BOARD]
C4005 47 6.3V
R4001 82
R4012 3.3k
IC4001 LA6672
15 5V
16 INT O
17 INT IN
18 DET O
19 ATZR
20 DET
21 RTM
22 AMP O
23 AMP IN
24 ABSW
25 A IN
26 B IN
27 3V
28 A GND
VC 14
V BAT 13
P GND 12
NN 11
FF 10
V REF 9
MN 8
MF 7
HL 6
CLK 5
MODE1 4
MODE2 3
IROR 2
IRFB 1
PUL4001
V +
A OUT
VO
B OUT
V −
D4001
C4001 47 6.3V
C4002 47 6.3V
R4002 82
R4003 6.8k
C4006 0.033
R4004 10
C4007 0.22
C4008 0.027
R4005 300k
C4009 220p
C4010 0.047
C4017 0.33
C4016 0.33
R4015 470
R4016 470
R4017 1k
R4018 1k
C4003 47 6.3V
IC4001
PREAMP/INFARED CONTROL
C4013 0.22
R4006 11k
R4007 47k
R4008 24k
R4009 7.5k
R4010 12k
R4011 10k
IC4002
AUTO FOCUS CONTROL
Q4001 2SD999
Q4001 LED DRIVE
R4013 18
R4014 18
C4004 100 10V
L4001 390μH
AF BLOCK UNIT
V +
A OUT
VO
B OUT
V −
IRED −
IRED +
PUL4002
2 1
IRED −
IRED +
PUL4003
1 2
MO FF
MO NN
M
M905 FOCUS MOTOR


IC4001
LA6672
VC
V BAT
P GND
NN
FF
V REF
MN
MF
HL
CLK
MODE1
MODE2
IROR
IRFB
R4012 3.3k
C4013 0.22
R4006 11k
R4007 47k
R4008 24k
R4009 7.5k
R4010 12k
R4011 10k
R4019 10k
Q4002 SENSOR SWITCH
Q4002 UN2211
C4015 100 10V
PUL4005
W SW
T SW
AF GND
AF CONT
SS C 5V
UN REG
UN REG GND
TO SS-93 BOARD CN005
(See page 123.)
PUL4006
PF-NN
COM
PF-FF
IC4002
AUTO FOCUS CONTROL
IC4002 MN15514
PF
VL
AF SW
MAC
DB
VSS
FOCUS
NC
RST
SOC2
SOC1
VDD
C4011 0.22
C4012 0.47
SERC
Q4001 2SD999
Q4001 LED DRIVE
R4013 18
R4014 18
C4004 100 10V
L4001 390μH
IC4003
ZOOM MOTOR DRIVE
IC4003 TK10500
GND
MO
M1
VCC
D1
DO
V REF
CONT
C4014 0.22
R4020 1.8k
R4021 2k
R4022 10k
R4023 10k
SW BLOCK UNIT
PUL4002
IRED -
IRED +
PUL4003
MO FF
MO NN
PUL4004
TELE
WIDE
M905 FOCUS MOTOR
M906 ZOOM MOTOR

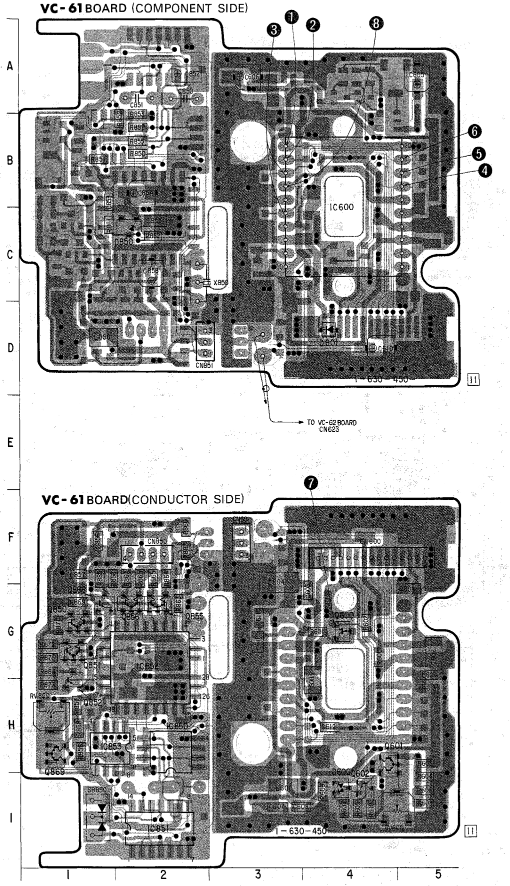

VC-61 BOARD (1/2)
IC850
INTEGRATER/DC1.7V BUFFER
IC850 MC34182MR
IC853
INVERTER/WHITE BALANCE DETECT
IC853 μPC393G2
R852 33k
R853 10k
R856 18k
R882 5600
RV85 10k
R851 10k
C852 4.7 10V
R855 15k
C850 470p
R850 1k
SB850 AM3208SN
CY
C
YE
C851 6800p
IC851
DISCHARGE/SENSOR SW
IC851 μPD4066BG
IC852 MC146805
B.L
DARK
DISCHG
SW
TEST
B.LTR
AUTO
WID
EX TIM
VDD
D850 MA151WA
R860 10k
R883 10k
C853 0.1 F
C854


13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
A
B
C
D
E
F
G
H
I
J
PUL4005
1 W SW
2 T SW
3 AF GND
4 AF CONT
5 SS C 5V
6 UN REG
7 UN REG GND
TO SS-93 BOARD
CN005
(See page 123.)
C4015
100
10V
PUL4006
3 PF-NN
2 COM
1 PF-FF
PF-NN
COM
PF-FF
SW BLOCK
UNIT
R4022 10k
R4023 10k
IC4003
ZOOM MOTOR DRIVE
IC4003
TK10500
GND
D1
MO
DO
M1
V REF
VCC
CONT
R4020 1.8k
R4021 2k
VC-61 BOARD (1/2)
IC850
INTEGRATER/DC1.7V BUFFER
IC850
MC34182MR
C850 470p
R850 1k
SB850
AM3208SN
CY
C
YE
C851
6800p
IC851
DISCHARGE/SENSOR SW
IC851
μPD4066BG
IC853
INVERTER/WHITE BALANCE DETECT
IC853
μPC393G2
R852 33k
R853 10k
R882 5600
R851 10k
C852 4.7 10V
R855 15k
R856 18k
R857 4.7k
R858 10k
RV850 10k
Q869
SWITCH
AUTO WHITE BALANCE
Q869
XN1213
Q850
Q851
Q852
D-A CONVERTER
Q850 XN1113
Q851 XN1113
Q852 2SA1341
R869 560k
R870 270k
R871 150k
R872 68k
R873 68k
R884 68k
IC852
MC146805F2FP
B.L
DARK
DISCHG
SW
TEST
B.LTR
AUTO
WID
EX TIM
VDD
RST
WBDET
NUM
VSS
B 0
R 4
R 3
R 2
R 1
R 0
OSC2
OSC1
R864 560k
R865 270k
R866 150k
R867 68k
R868 68k
R885 68k
Q868 2SC3395
Q855 XN1213
Q856 XN1213
Q855
Q856
Q868
D-A CONVERTER
D850
MA151WA
R860 10k
R861 100k
R862 10k
R863 1M
R883 10k
C853 0.1 F
C855 1.0 F
C854 10 16V
X850
CSA4.00MG
IC852
AUTO WHITE BALANCE CONTROL
C856 0.1 F
C857 0.1 F
L850 47μH
C858 10 16V
CN850 4P (WHT)
4 R CONT
3 B CONT
2 GND
1 5V
CN851 3P (WHT)
3 GND
2 AUTO
1 WID
TO VC-63 BOARD
CN701
(See page 95.)
TO FC-25 BOARD
CN101
(See page 135.)
CAMERA REC mode
✱: Impossible to measure the voltage at the marked points.

VC-61 (AUTO WHITE BALANCE) PRINTED WIRING BOARD

—Ref. No. VC-61 BOARD ; 1,000 series—

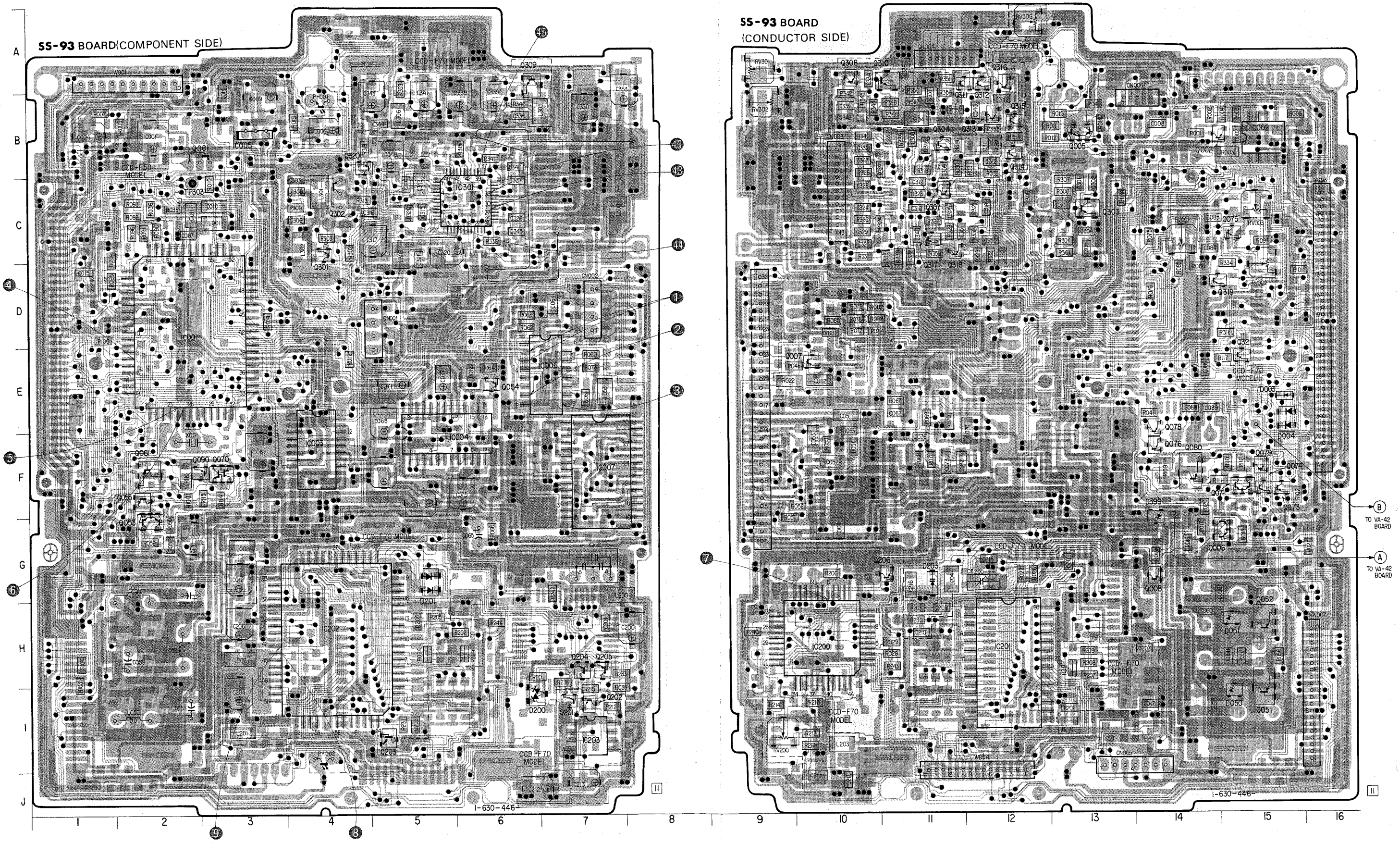
D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1


VC-61 BOARD (COMPONENT SIDE)
VC-61 BOARD(CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
1
2
3
4
5
❶
❷
❸
❹
❺
❻
❼
❽
IC600
IC602
IC603
C851
C852
Q850
X850
D850
D601
C610
CN851
IC852
CN850
IC853
IC850
IC851
Q851
Q852
Q855
Q856
Q869
Q600
Q601
Q602
D600
RV850
1-630-450
11
TO VC-62 BOARD CN623

SS-93 (DIGITAL TITLER) PRINTED WIRING BOARD

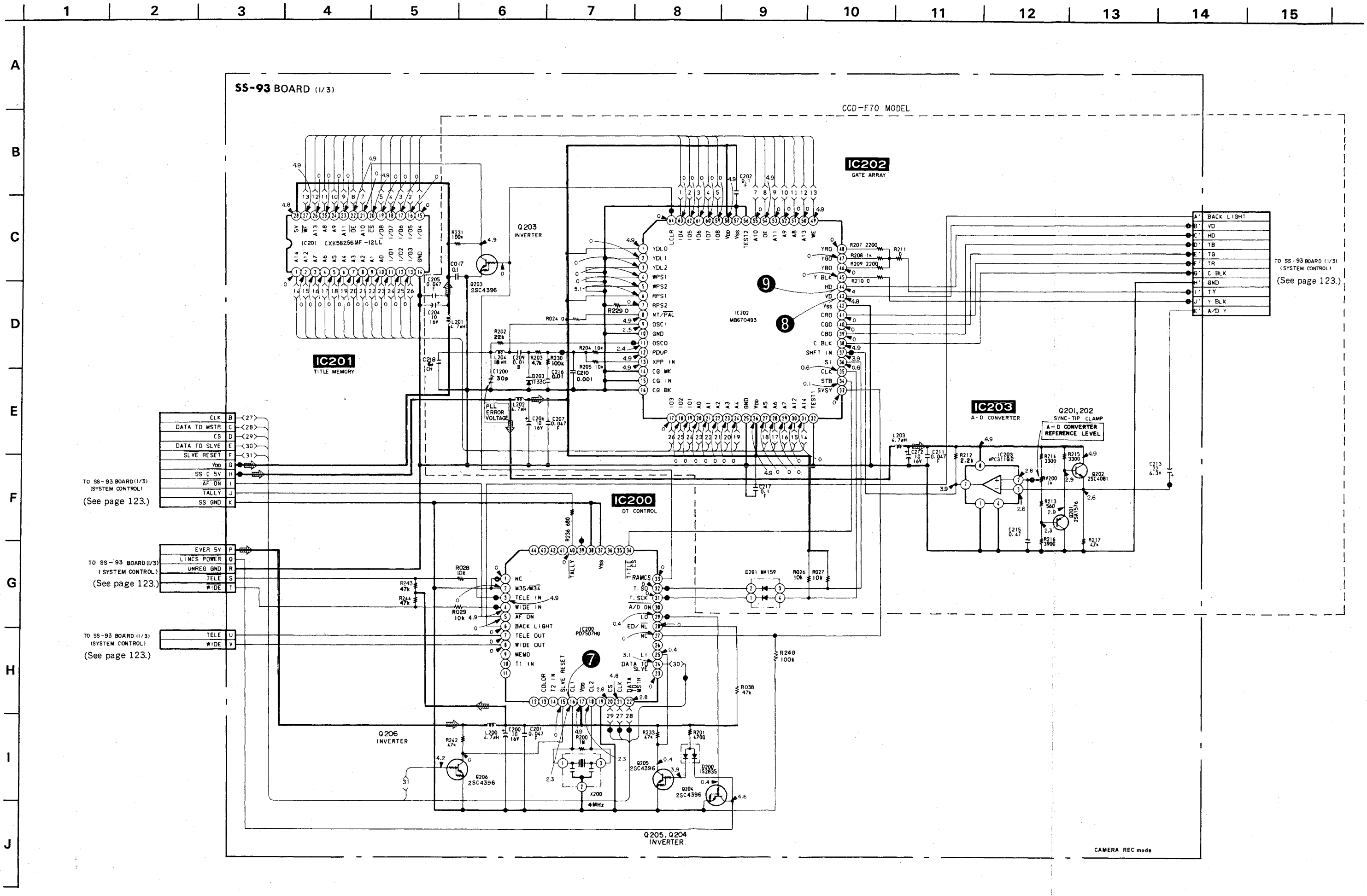
—Ref. No. SS-93 BOARD ; 2,000 series—

D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D201	G-5
D203	G-11
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC201	H-12
IC202	H-4
IC203	I-7
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q201	I-7
Q202	I-7
Q203	I-5
Q204	H-7
Q205	H-7
Q206	G-11
Q301	C-4
Q302	C-4
Q303	C-13
Q304	B-11
Q307	C-11
Q308	A-10
Q309	A-6
Q310	A-11
Q311	A-12
Q312	A-12
Q313	B-12
Q314	B-12
Q315	B-12
Q316	A-12
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4
Q321	F-15

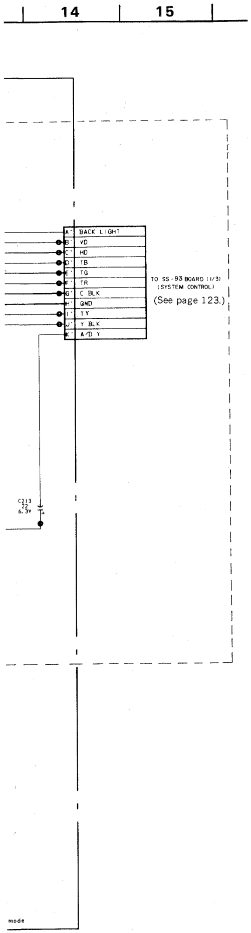

SS-93 BOARD(COMPONENT SIDE)
SS-93 BOARD
(CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
①
②
③
④
⑤
⑥
⑦
⑧
⑨
㊸
㊹
㊺
IC001
IC003
IC004
IC005
IC006
IC007
IC202
IC203
IC301
IC200
IC201
IC002
CCD-F50 MODEL
CCD-F70 MODEL
TO VA-42 BOARD
1-630-446-

SS-93 (DIGITAL TITLER) SCHEMATIC DIAGRAM

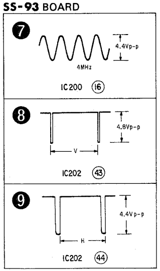
—Ref. No. SS-93 BOARD ; 2,000 series—



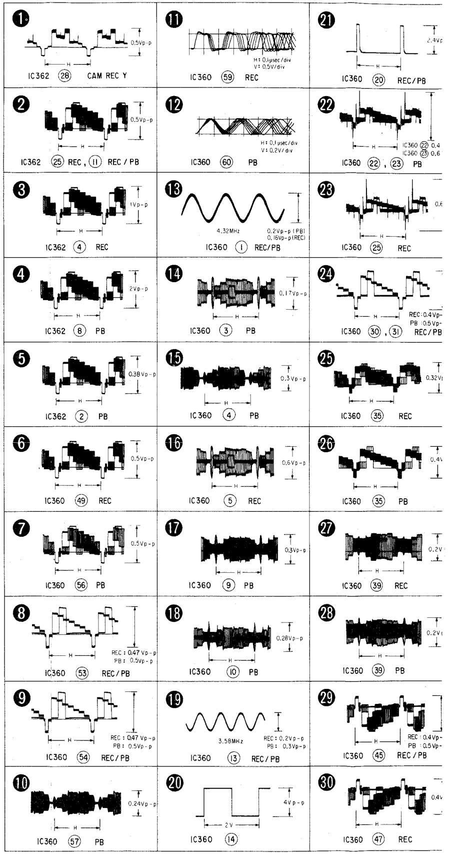
SS-93 BOARD (1/3)
CCD-F70 MODEL
IC201
TITLE MEMORY
IC201 CXK58256MF-12LL
IC202
GATE ARRAY
IC202 MB670493
IC200
DT CONTROL
IC200 PD7507HG
IC203
A-D CONVERTER
IC203 μPC311G2
Q201, 202
SYNC-TIP CLAMP
A-D CONVERTER REFERENCE LEVEL
Q203
INVERTER
Q203 2SC4396
Q206
INVERTER
Q206 2SC4396
Q205, Q204
INVERTER
Q205 2SC4396
Q204 2SC4396
Q202 2SC4081
Q201 2SA1576
D201 MA159
D200 1SS283
D203 1T33C
X200 4MHz
PLL ERROR VOLTAGE
CLK
DATA TO MSTR
CS
DATA TO SLVE
SLVE RESET
VDD
SS C 5V
AF ON
TALLY
SS GND
TO SS-93 BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
EVER 5V
LINCS POWER
UNREG GND
TELE
WIDE
TO SS-93 BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
TELE
WIDE
TO SS-93 BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
BACK LIGHT
VD
HD
TB
TG
TR
C BLK
GND
YY
Y BLK
A/D Y
TO SS-93 BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
YDL0
YDL1
YDL2
WPS1
WPS2
RPS1
RPS2
NT/PAL
OSCI
GND
OSCO
PDUP
XPP IN
CG MK
CG IN
CG BK
YRO
YGO
YBO
Y BLK
HD
VD
VSS
CRO
CGO
CBO
C BLK
SHFT IN
SI
CLK
STB
SVSY
NC
M35/M34
TELE IN
WIDE IN
AF ON
BACK LIGHT
TELE OUT
WIDE OUT
MEMO
T1 IN
RAMCS
T. SO
T. SCK
A/D ON
LD
ED/NL
NC
L1
DATA TO SLVE
COLOR
T2 IN
SLVE RESET
CL1
VDD
CL2
CS
CLK
DATA TO MSTR
TALLY
VSS
TITLE CS
7
8
9
CAMERA REC mode
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15


14
15
A' BACK LIGHT
B' VD
C' HD
D' TB
E' TG
F' TR
G' C BLK
H' GND
I' TY
J' Y BLK
K' A/D Y
TO SS-93 BOARD (1/3)
(SYSTEM CONTROL)
(See page 123.)
C213
22
6.3V
mode

SS-93 BOARD

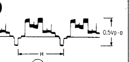


VA-42 BOARD



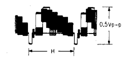
VA-42 BOARD

1



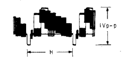
IC362 ㉘ CAM REC Y

2



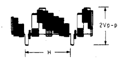
IC362 ㉕ REC, ⑪ REC / PB

3



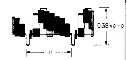
IC362 ④ REC

4



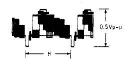
IC362 ⑧ PB

5



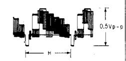
IC362 ② PB

6



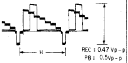
IC360 ㊾ REC

7



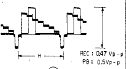
IC360 ㊻ PB

8



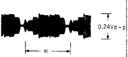
IC360 ㊸ REC / PB

9



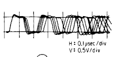
IC360 ㊹ REC / PB

10



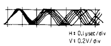
IC360 ㊼ PB

11



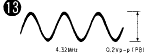
IC360 ㊿ REC

12



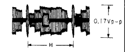
IC360 (60) PB

13



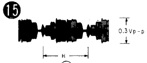
IC360 ① REC/PB

14



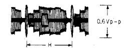
IC360 ③ PB

15



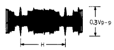
IC360 ④ PB

16



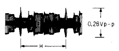
IC360 ⑤ REC

17



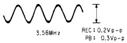
IC360 ⑨ PB

18



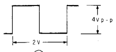
IC360 ⑩ PB

19



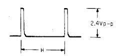
IC360 ⑬ REC / PB

20



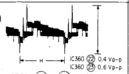
IC360 ⑭

21



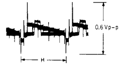
IC360 ⑳ REC/PB

22



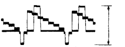
IC360 ㉒, ㉓ PB

23



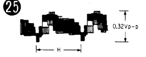
IC360 ㉕ REC

24



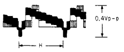
IC360 ㉚, ㉛ REC/PB

25



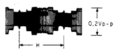
IC360 ㉟ REC

26



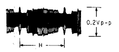
IC360 ㉟ PB

27



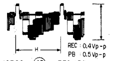
IC360 ㊴ REC

28



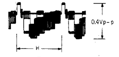
IC360 ㊴ PB

29



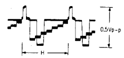
IC360 ㊺ REC / PB

30



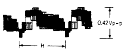
IC360 ㊼ REC

31



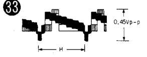
IC360 ㊼ PB

32



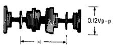
IC361 ⑱ REC

33



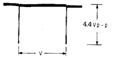
IC361 ⑱ PB

34



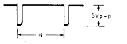
IC364 ① CAM REC C

35



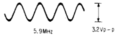
IC367 ⑱ CAM REC

36



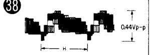
IC367 ⑲ CAM REC

37



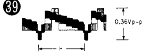
IC250 ⑭ REC / PB

38



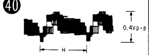
IC369 ② REC

39



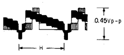
IC369 ① REC

40



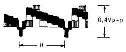
IC369 ⑮ REC, PB

41



IC369 ② PB

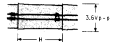
42



IC369 ① PB

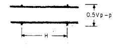
SS-93 BOARD

43



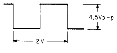
IC301 ㉘, ㉝ REC

44



IC301 ⑯ PB

45

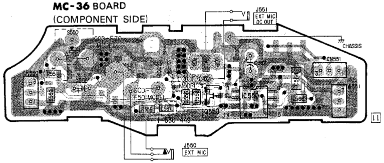


IC301 ㊴ REC/PB

SS-93 (REC/PB AMP), VA-42 (VIDEO/AUDIO SIGNAL PROESS), MC-36 (MIC AMP, START/STOP SWITCH) PRINTED WIRING BOARDS

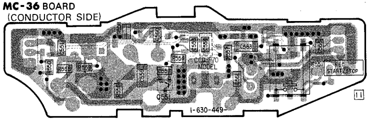
—Ref. No. SS-93, VA-42, MC-36 BOARDS ; 2,000 series—

MC-36 BOARD
(COMPONENT SIDE)



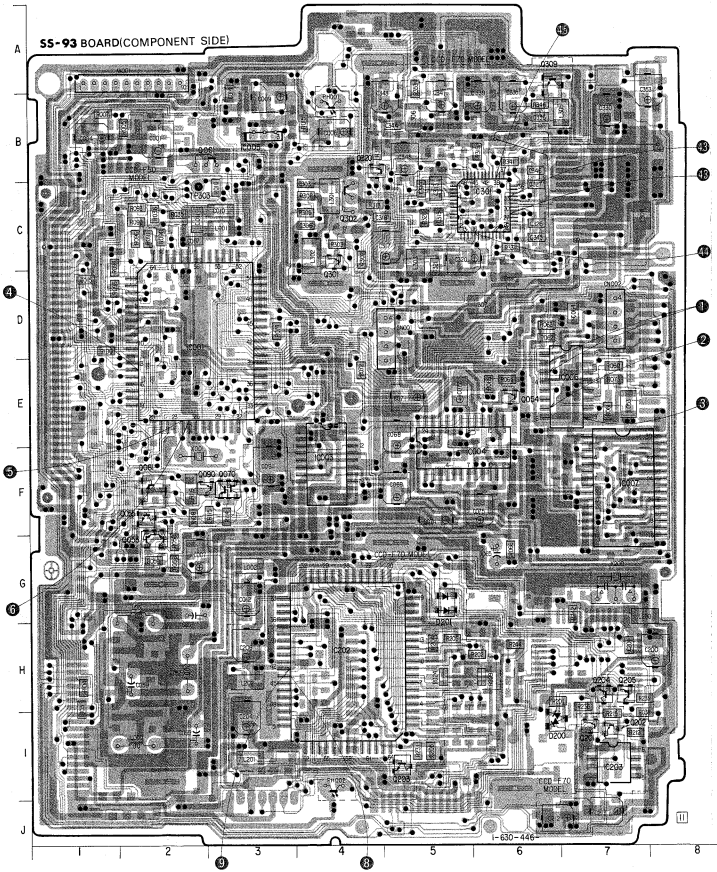
J551
EXT MIC
DC OUT
CHASSIS
CN551
S550
CCD-F50 MODEL
CCD-F70 MODEL
IC550
Q550
J550
EXT MIC
1-630-449
11

MC-36 BOARD
(CONDUCTOR SIDE)



CCD-F70 MODEL
REC START/STOP
Q551
1-630-449
11

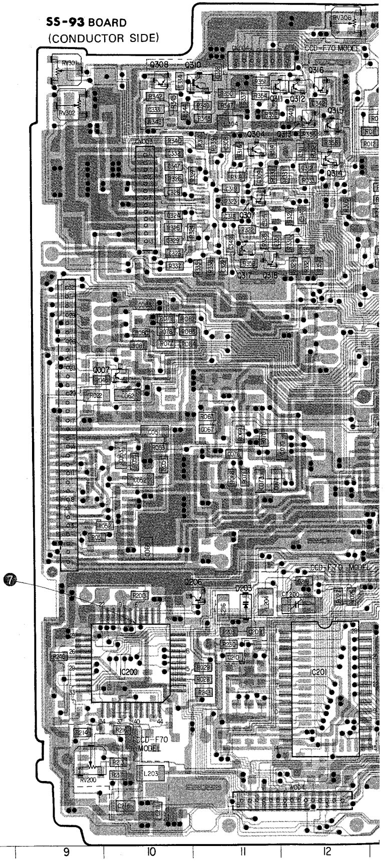
SS-93 BOARD(COMPONENT SIDE)



A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
CCD-F70 MODEL
CCD-F50 MODEL
IC001
IC003
IC004
IC005
IC006
IC007
IC202
IC203
IC301
D200
D201
Q001
Q053
Q054
Q055
Q070
Q080
Q090
Q201
Q202
Q203
Q204
Q205
Q301
Q302
Q309
Q320
PH001
PH002
TP303
X001
CN002
1-630-446
11
④
⑤
⑥
⑨
⑧
㊺
㊸
㊸
㊹
①
②
③

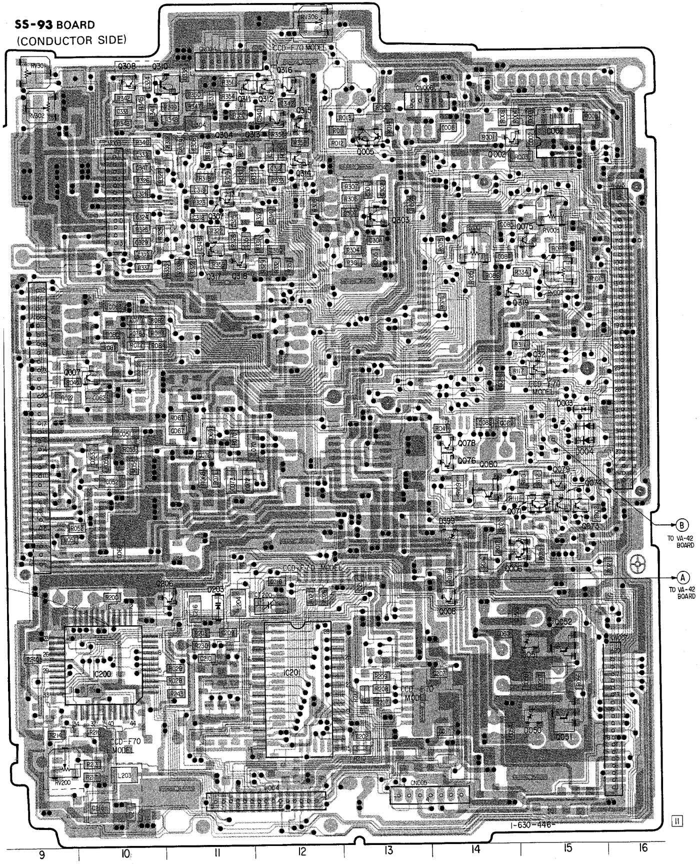
D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D201	G-5
D203	G-11
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC201	H-12
IC202	H-4
IC203	I-7
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q201	I-7
Q202	I-7
Q203	I-5
Q204	H-7
Q205	H-7
Q206	G-11
Q301	C-4
Q302	C-4
Q303	C-13
Q304	B-11
Q307	C-11
Q308	A-10
Q309	A-6
Q310	A-11
Q311	A-12
Q312	A-12
Q313	B-12
Q314	B-12
Q315	B-12
Q316	A-12
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4
Q321	F-15

SS-93 BOARD
(CONDUCTOR SIDE)



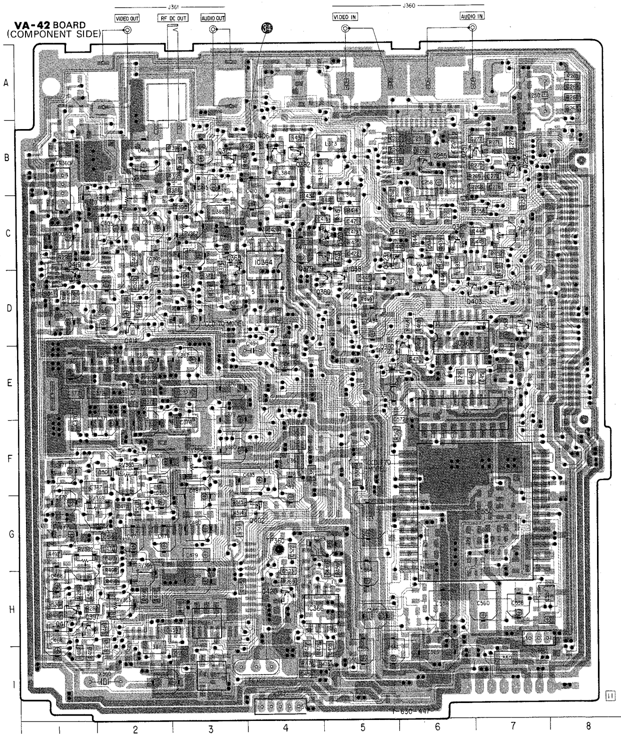
9
10
11
12
RV301
RV302
RV200
Q308
Q310
Q316
Q304
Q312
Q311
Q313
Q314
Q315
Q307
Q317
Q318
Q007
Q206
IC200
IC201
D203
CCD-F70 MODEL
⑦

SS-93 BOARD
(CONDUCTOR SIDE)

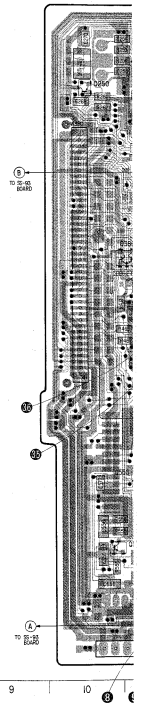

CCD-F70 MODEL
B
TO VA-42 BOARD
A
TO VA-42 BOARD
IC200
IC201
1-630-446-
9
10
11
12
13
14
15
16

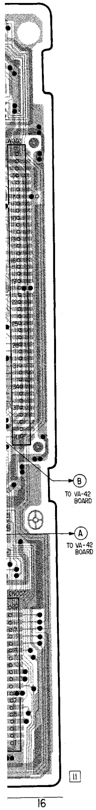
D369	C-5
D370	I-16
D371	E-12
D373	B-16
IC250	B-12
IC360	H-15
IC361	E-16
IC362	C-16
IC364	C-4
IC365	D-14
IC366	H-4
IC367	E-11
IC368	E-6
IC369	C-15
IC550	G-7
Q250	B-10
Q251	B-7
Q252	B-7
Q253	A-14
Q254	A-14
Q255	B-6
Q360	G-13
Q361	F-13
Q362	F-13
Q363	C-14
Q364	D-14
Q365	C-3
Q366	D-16
Q367	D-16
Q369	B-15
Q370	B-16
Q371	A-16
Q372	B-14
Q373	B-14
Q374	B-15
Q375	B-3
Q376	C-13
Q377	D-13
Q378	C-13
Q379	C-5
Q380	D-5
Q381	D-5
Q382	B-4
Q383	C-12
Q384	C-12
Q385	C-6
Q386	D-11
Q387	D-13
Q388	C-11
Q389	H-13
Q390	H-13
Q392	E-6
Q393	D-7
Q394	H-13
Q395	I-15
Q396	H-17
Q397	H-1
Q398	H-17
Q399	H-17
Q400	F-16
Q401	G-14
Q402	G-4
Q403	D-7
Q404	D-7
Q405	B-17
Q406	B-4
Q407	B-14
Q408	F-16
Q410	F-17
Q411	G-17
Q412	F-16
Q413	F-16
Q414	D-2
Q415	I-13
Q416	I-13
Q417	H-1
Q419	D-1
Q420	H-4
Q421	H-14
Q423	D-6
Q424	B-15
Q425	C-16
Q426	C-16
Q550	G-11
Q551	H-10
Q552	H-12
Q553	G-12
Q554	H-12
Q555	G-12
Q556	G-11
Q557	G-11

VA-42 BOARD
(COMPONENT SIDE)


J361
VIDEO OUT
RF DC OUT
AUDIO OUT
J360
VIDEO IN
AUDIO IN
34
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
9
10
IC364
IC366
IC550
1-630-447

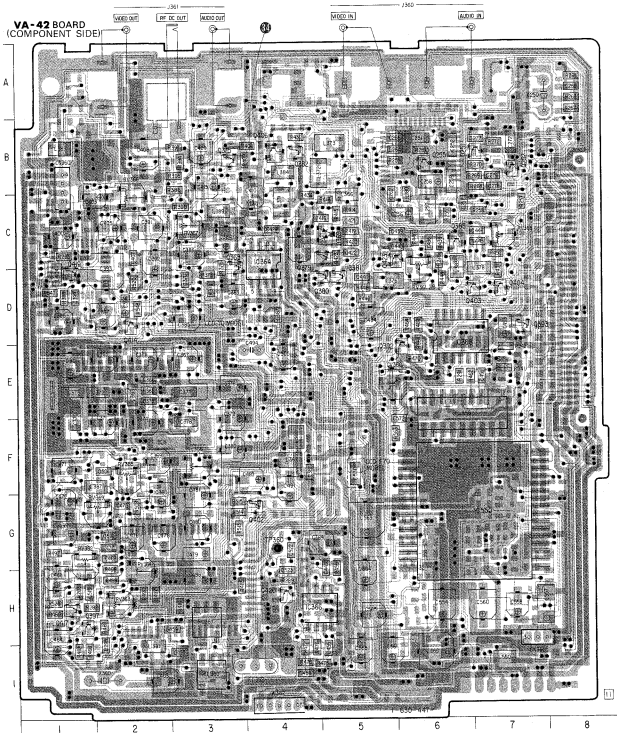
VA-42 BOARD
(CONDUCTOR SIDE)


B
TO SS-93 BOARD
A
TO SS-93 BOARD
36
35
8


TO VA-42 BOARD
TO VA-42 BOARD
16

D369	C-5
D370	I-16
D371	E-12
D373	B-16
IC250	B-12
IC360	H-15
IC361	E-16
IC362	C-16
IC364	C-4
IC365	D-14
IC366	H-4
IC367	E-11
IC368	E-6
IC369	C-15
IC550	G-7
Q250	B-10
Q251	B-7
Q252	B-7
Q253	A-14
Q254	A-14
Q255	B-6
Q360	G-13
Q361	F-13
Q362	F-13
Q363	C-14
Q364	D-14
Q365	C-3
Q366	D-16
Q367	D-16
Q369	B-15
Q370	B-16
Q371	A-16
Q372	B-14
Q373	B-14
Q374	B-15
Q375	B-3
Q376	C-13
Q377	D-13
Q378	C-13
Q379	C-5
Q380	D-5
Q381	D-5
Q382	B-4
Q383	C-12
Q384	C-12
Q385	C-6
Q386	D-11
Q387	D-13
Q388	C-11
Q389	H-13
Q390	H-13
Q392	E-6
Q393	D-7
Q394	H-13
Q395	I-15
Q396	H-17
Q397	H-1
Q398	H-17
Q399	H-17
Q400	F-16
Q401	G-14
Q402	G-4
Q403	D-7
Q404	D-7
Q405	B-17
Q406	B-4
Q407	B-14
Q408	F-16
Q410	F-17
Q411	G-17
Q412	F-16
Q413	F-16
Q414	D-2
Q415	I-13
Q416	I-13
Q417	H-1
Q419	D-1
Q420	H-4
Q421	H-14
Q423	D-6
Q424	B-15
Q425	C-16
Q426	C-16
Q550	G-11
Q551	H-10
Q552	H-12
Q553	G-12
Q554	H-12
Q555	G-12
Q556	G-11
Q557	G-11

VA-42 BOARD
(COMPONENT SIDE)


J361
VIDEO OUT
RF DC OUT
AUDIO OUT
J360
VIDEO IN
AUDIO IN
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A
B
C
D
E
F
G
H
I
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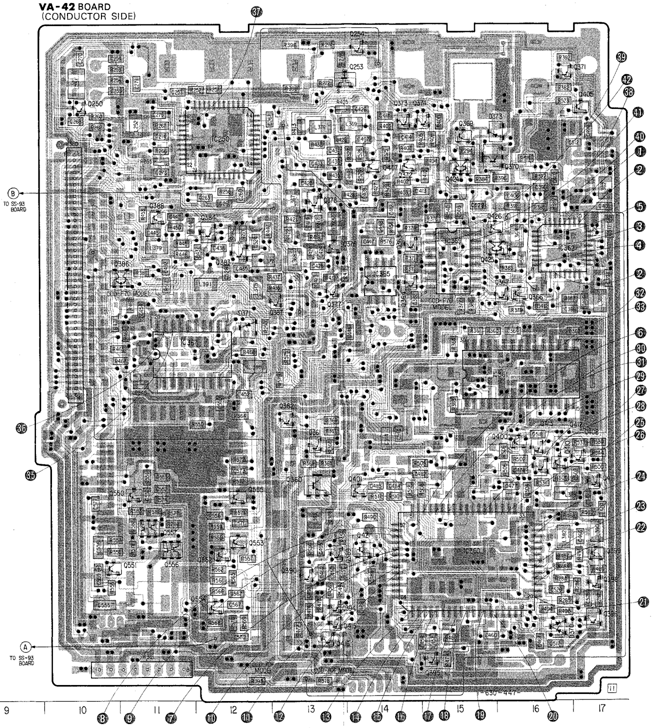
IC364
IC366
IC368
CCD-F70 MODEL
1-630-447-

VA-42 BOARD
(CONDUCTOR SIDE)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B
TO SS-93 BOARD
A
TO SS-93 BOARD
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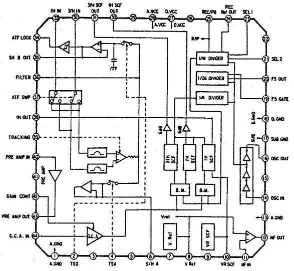
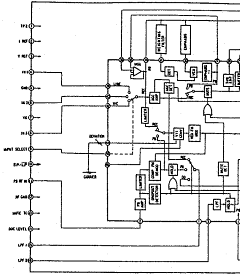
IC250
CCD-F70 MODEL
1-630-447-

IC250 (VA-42) CXA1204Q

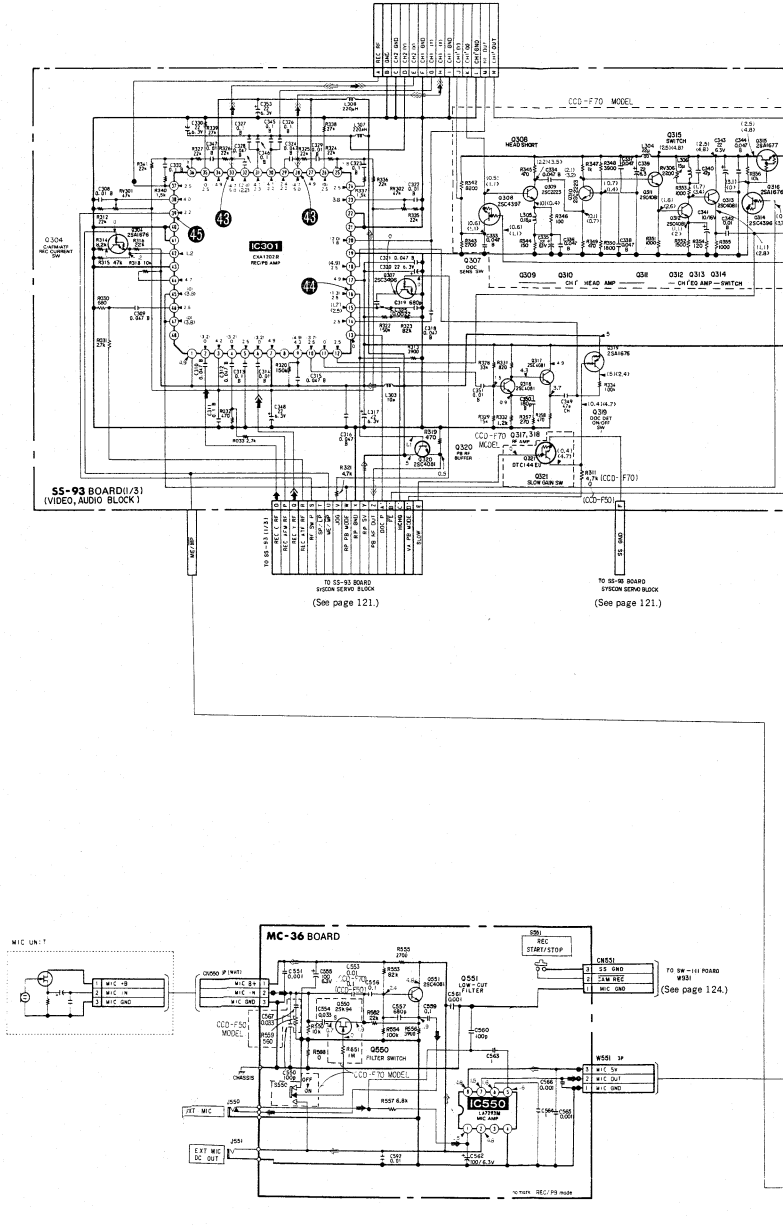


fH IN
3fH IN
3fH SCF OUT
fH SCF OUT
A.VCC
D.VCC
REC/PB
REC Ref OUT
SEL 1
ATF LOCK
SH B OUT
FILTER
ATF SWP
fH OUT
TRACKING
PRE AMP IN
PRE AMP
GAIN CONT
PRE AMP OUT
G.C.A. IN
A.GND
TSD
TSA
S/H A
V Ref
VR SCF
NF IN
R/P
1/M DIVIDER
1/26 DIVIDER
1/4 DIVIDER
SEL 2
FS OUT
FS GATE
D.GND
SUB GND
OSC OUT
OSC IN
A.GND
NF OUT
3fH SCF
fH SCF
B.M.
Vref
V. Ref
VR SCF
G.C.A

IC550 (VA-42) SBX1505-01



(See page 121.)



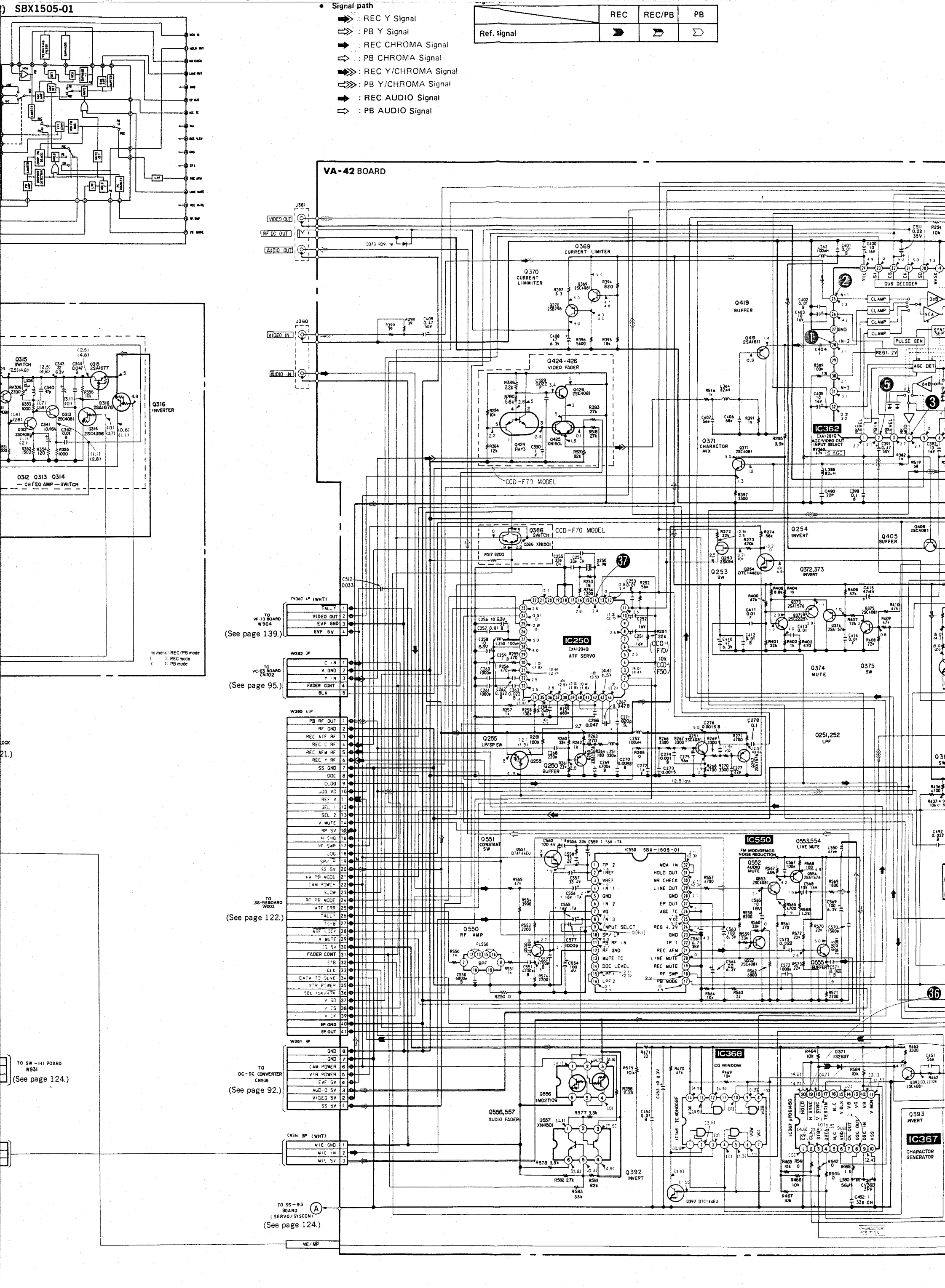
TO SS-93 BOARD (SYSCON SERVO BLOCK)
REC RF
DMC
CH2 GND
CH2 (Y)
CH2 (X)
CH1 GND
CH1 (Y)
CH1 (X)
CH1' (Y)
CH1' (X)
CH1' GND
N.C
CH1' OUT
CCD-F70 MODEL
Q308 HEAD SHORT
Q315 SWITCH
IC301
CXA1202R REC/PB AMP
43
44
45
Q304 C/AFM/ATF REC CURRENT SW
Q307 DOC SENS SW
Q309 Q310 CH1' HEAD AMP
Q311
Q312 Q313 Q314 CH1'EQ AMP — SWITCH
Q319 DOC DET ON/OFF SW
Q320 PB RF BUFFER
CCD-F70 MODEL Q317, 318 RF AMP
Q321 DTC144EU SLOW GAIN SW
SS-93 BOARD(1/3) (VIDEO, AUDIO BLOCK)
TO SS-93 (1/3)
REC C RF
REC AFM RF
REC Y RF
REC ATF RF
RF SW P
SP-LP
ME/MP
JOG
RP PB MODE
RP GND
RP SV
PB NF OUT
DOC P
FE
HCHG
VA PB MODE
SLOW
TO SS-93 BOARD SYSCON SERVO BLOCK
(See page 121.)
SS GND
TO SS-93 BOARD SYSCON SERVO BLOCK
(See page 121.)
(CCD-F70)
(CCD-F50)
MIC UNIT
MIC +B
MIC IN
MIC GND
MC-36 BOARD
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
S551 REC START/STOP
CN551
SS GND
CAM REC
MIC GND
TO SW-111 BOARD W931
(See page 124.)
Q551 LOW-CUT FILTER
Q551 2SC4081
Q550 2SK94
Q550 FILTER SWITCH
CCD-F50 MODEL
CCD-F70 MODEL
CHASSIS
S550 OFF ON
J550 EXT MIC
J551 EXT MIC DC OUT
IC550 LA7293M MIC AMP
W551 3P
MIC 5V
MIC OUT
MIC GND
no mark REC/PB mode

2) SBX1505-01

- **Signal path**

➡ : REC Y Signal
⇨ : PB Y Signal
➡ : REC CHROMA Signal
⇨ : PB CHROMA Signal
➡ : REC Y/CHROMA Signal
⇨ : PB Y/CHROMA Signal
➡ : REC AUDIO Signal
⇨ : PB AUDIO Signal

	REC	REC/PB	PB
Ref. signal	➡	⇨	▷


SBX1505-01
VA-42 BOARD
J361
VIDEO OUT
RF DC OUT
AUDIO OUT
J360
VIDEO IN
AUDIO IN
Q369 CURRENT LIMITER
Q370 CURRENT LIMMITER
Q419 BUFFER
Q424-426 VIDEO FADER
CCD-F70 MODEL
Q371 CHARACTOR MIX
IC362 CXA1201Q AGC/VIDEO OUT INPUT SELECT
DUS DECODER
CLAMP
PULSE GEN
AGC DET
Q315 SWITCH
Q316 INVERTER
Q312 Q313 Q314 — CH/EQ AMP —SWITCH
no mark: REC/PB mode
( ): REC mode
< >: PB mode
Q386 SWITCH
IC250 CXA1204Q ATF SERVO
Q254 INVERT
Q405 BUFFER
Q253 SW
Q372,373 INVERT
Q374 MUTE
Q375 SW
Q255 LP/SP SW
Q250 BUFFER
Q251,252 LPF
TO VF-13 BOARD W904
(See page 139.)
TO VC-63 BOARD CN702
(See page 95.)
TO SS-93 BOARD W003
(See page 122.)
TO DC-DC CONVERTER CN936
(See page 92.)
TO SW-111 BOARD W931
(See page 124.)
TO SS-93 BOARD (SERVO/SYSCON)
(See page 124.)
Q551 CONSTANT SW
Q550 RF AMP
IC550 SBX-1505-01
IC550 FM MOD/DEMOD NOISE REDUCTION
Q553,554 LINE MUTE
Q552 AUDIO MUTE
Q555 BUFFER
Q556,557 AUDIO FADER
IC368 CG WINDOW
Q392 INVERT
IC367 CHARACTOR GENERATOR
Q393 INVERT

- **Signal path**

➡ : REC Y Signal

⇨ : PB Y Signal

➡ : REC CHROMA Signal

⇨ : PB CHROMA Signal

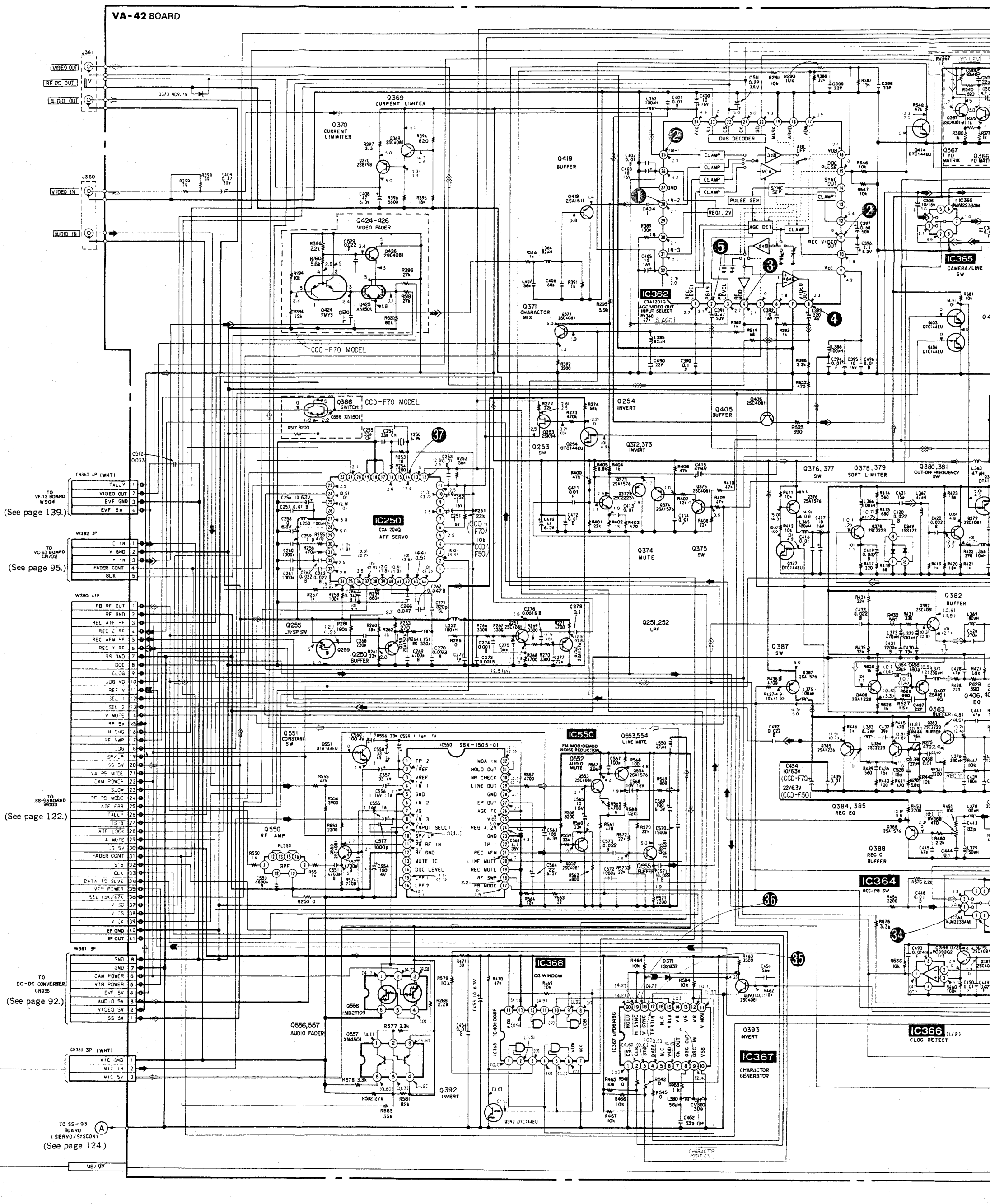
➡ : REC Y/CHROMA Signal

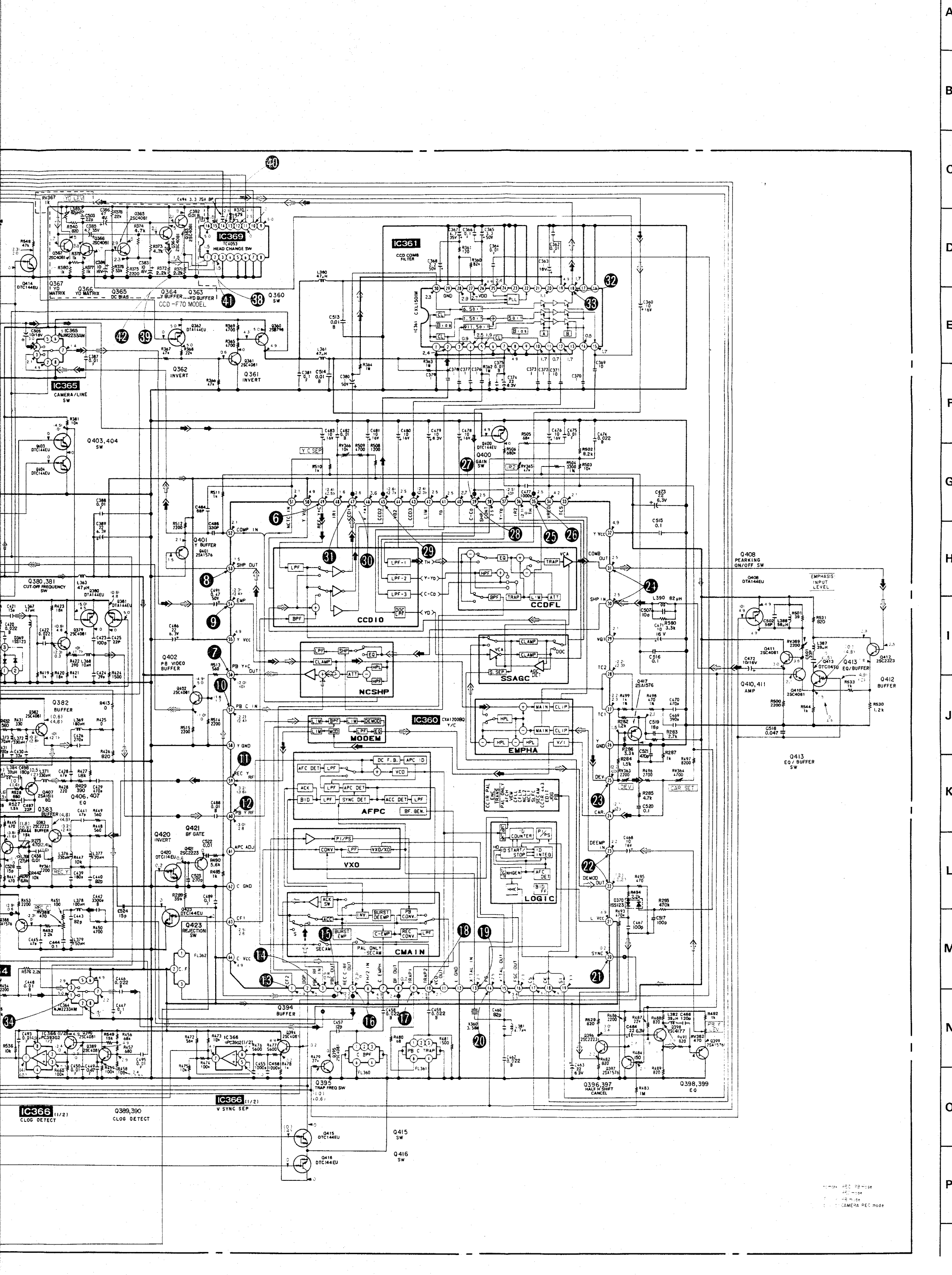
⇨ : PB Y/CHROMA Signal

➡ : REC AUDIO Signal

⇨ : PB AUDIO Signal

	REC	REC/PB	PB
Ref. signal	➡	⇨	▷


VA-42 BOARD
VIDEO OUT
RF DC OUT
AUDIO OUT
J361
J360
VIDEO IN
AUDIO IN
Q369 CURRENT LIMITER
Q370 CURRENT LIMMITER
Q424-426 VIDEO FADER
CCD-F70 MODEL
Q419 BUFFER
Q371 CHARACTOR MIX
IC362 CXA1201Q AGC/VIDEO OUT INPUT SELECT
DUS DECODER
CLAMP
PULSE GEN
SYNC SEP
AGC DET
REG1.2V
IC365 NJM2233AM CAMERA/LINE SW
Q414 DTC144EU
Q367 Y/C MATRIX
Q386 SWITCH
CCD-F70 MODEL
IC250 CXA1204Q ATF SERVO
Q253 SW
Q254 INVERT
Q405 BUFFER
Q372,373 INVERT
Q374 MUTE
Q375 SW
Q376, 377 SW
Q378, 379 SOFT LIMITER
Q380, 381 CUT-OFF FREQUENCY SW
Q255 LP/SP SW
Q250 BUFFER
Q251,252 LPF
Q382 BUFFER
Q387 SW
Q383 BUFFER
Q384, 385 REC EQ
Q388 REC C BUFFER
IC364 REC/PB SW
Q551 CONSTANT SW
IC550 SBX-1505-01
Q550 RF AMP
IC550 FM MOD/DEMOD NOISE REDUCTION
Q552 AUDIO MUTE
Q553,554 LINE MUTE
Q555 BUFFER
IC368 CG WINDOW
IC367 CHARACTOR GENERATOR
IC366 (1/2) CLOG DETECT
Q393 INVERT
Q392 INVERT
Q556,557 AUDIO FADER
CN360 4P (WHT)
TO VF-13 BOARD W904
(See page 139.)
TALLY
VIDEO OUT
EVF GND
EVF 5V
W382 3P
TO VC-63 BOARD CN702
(See page 95.)
C IN
V GND
Y IN
FADER CONT
BLK
W380 41P
TO SS-93 BOARD W003
(See page 122.)
PB RF OUT
RF GND
REC ATF RF
REC C RF
REC AFM RF
REC Y RF
SS GND
DOC
CLOG
JOG VD
REF V
SEL 1
SEL 2
V MUTE
RP 5V
H CHG
RF SWP
JOG
SP/LP
SS 5V
VA PB MODE
CAM POWER
SLOW
RP PB MODE
ATF ERR
TALLY
TS-B
ATF LOCK
A MUTE
CG 5V
FADER CONT
STB
CLK
DATA TO DLVE
VTR POWER
SEL 15K/47K
V SC
V CS
V CK
EP GND
EP OUT
W381 8P
TO DC-DC CONVERTER CN936
(See page 92.)
GND
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
CN361 3P (WHT)
MIC GND
MIC IN
MIC 5V
TO SS-93 BOARD (SERVO/SYSCON)
(See page 124.)
ME/MP


A
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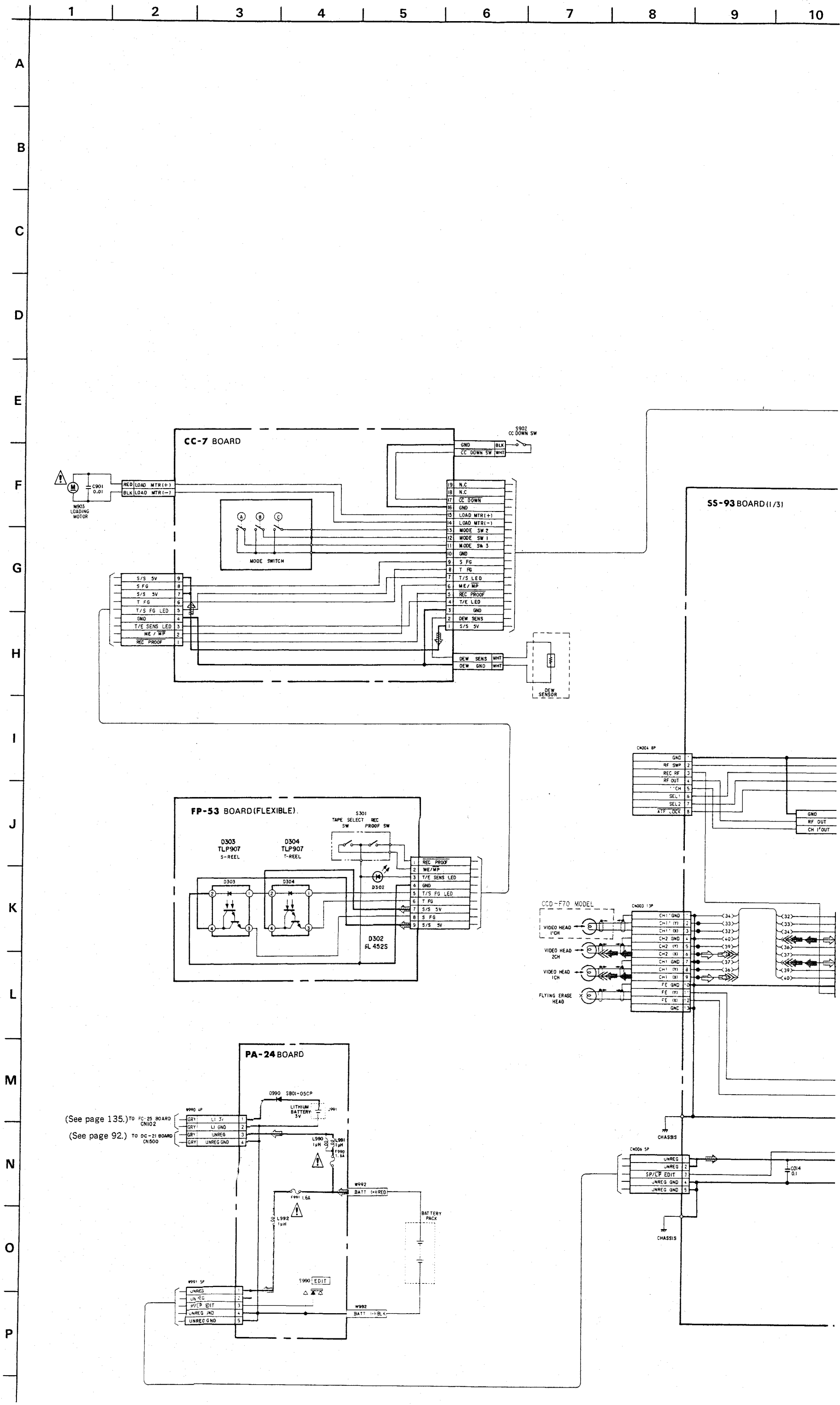
J
K
L
M
N
O
P
IC361
CCD COMB FILTER
CXL1501M
IC369
TC4053
HEAD CHANGE SW
IC365
CAMERA/LINE SW
NJM2233AM
IC360
CXA1200BQ
Y/C
CCD10
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
LOGIC
CMAIN
IC366 (1/2)
CLOG DETECT
IC366 (1/2)
V SYNC SEP
Q367 YD MATRIX
Q366 YD MATRIX
Q365 DC BIAS
Q364 Y BUFFER
Q363 YD BUFFER
CCD-F70 MODEL
Q360 SW
Q362 INVERT
Q361 INVERT
Q403,404 SW
Q380,381 CUT-OFF FREQUENCY SW
Q401 Y BUFFER
Q402 PB VIDEO BUFFER
Q382 BUFFER
Q406,407 EQ
Q383 BUFFER
Q420 INVERT
Q421 BF GATE
Q423 REJECTION SW
Q394 BUFFER
Q389,390 CLOG DETECT
Q395 TRAP FREQ SW
Q415 SW
Q416 SW
Q400 GAIN SW
Q408 PEARKING ON/OFF SW
EMPHASIS INPUT LEVEL
Q410,411 AMP
Q413 EQ/BUFFER
Q412 BUFFER
Q413 EQ/BUFFER SW
Q396,397 HALF H SHIFT CANCEL
Q398,399 EQ
FL360 C BPF
FL361 PB C TRAP
FL362
REC Y
REC C
YC LEV
Y.C SEP
DEV.
CAR.SET
PB Y LEV
X360 3.58M
( ) mode : REC, PB mode
REC mode
( ) : PB mode
( ) : CAMERA REC mode

VIDEO/AUDIC

SS-93 (SERVO/SYSTEM CONTROL), SW-111 (START/STOP SWITCH, STANDBY SWITCH, IN/OUT JACK), ZM-10 (ZOOM SWITCH), PA-24 (POWER), CC-7 (MOD

—Ref. No. SS-93 BOARD ; 2,000 series, SW-111, ZM-10, PA-24, CC-7, FP-53 BOARDS ; 3,000 series—



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A
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J
K
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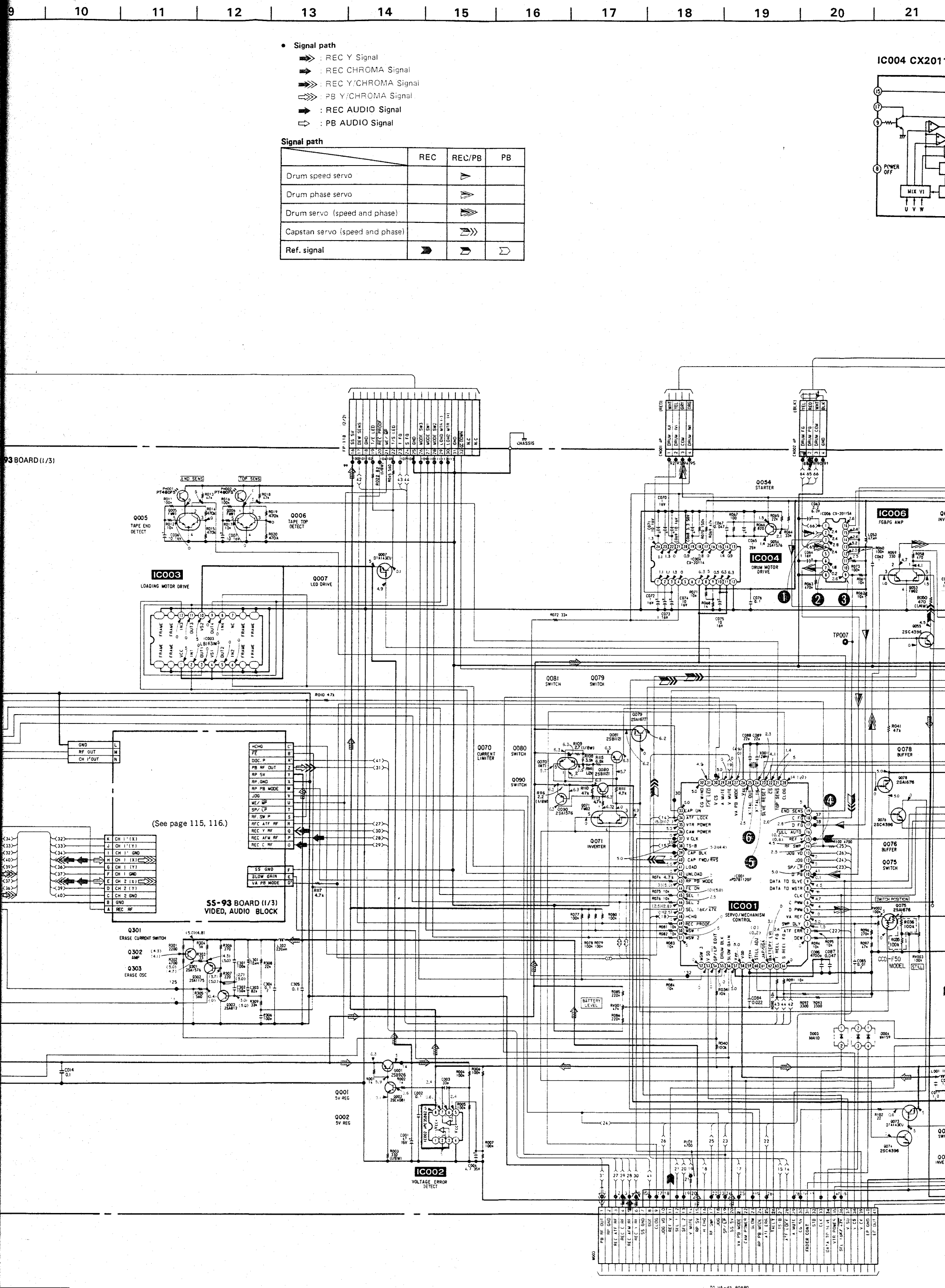
M
N
O
P
CC-7 BOARD
S902 CC DOWN SW
GND
CC DOWN SW
BLK
WHT
M903 LOADING MOTOR
C901 0.01
RED LOAD MTR(+)
BLK LOAD MTR(−)
MODE SWITCH
N.C
N.C
CC DOWN
GND
LOAD MTR(+)
LOAD MTR(−)
MODE SW 2
MODE SW 1
MODE SW 3
GND
S FG
T FG
T/S LED
ME/MP
REC PROOF
T/E LED
GND
DEW SENS
S/S 5V
S/S 5V
S FG
S/S 5V
T FG
T/S FG LED
GND
T/E SENS LED
ME/MP
REC PROOF
DEW SENS
DEW GND
DEW SENSOR
SS-93 BOARD (1/3)
CN004 8P
GND
RF SWP
REC RF
RF OUT
1'CH
SEL1
SEL2
ATF LOCK
GND
RF OUT
CH 1'OUT
FP-53 BOARD (FLEXIBLE)
S301 TAPE SELECT SW
REC PROOF SW
D303 TLP907 S-REEL
D304 TLP907 T-REEL
D302
D302 SL 452S
REC PROOF
ME/MP
T/E SENS LED
GND
T/S FG LED
T FG
S/S 5V
S FG
S/S 5V
CCD-F70 MODEL
VIDEO HEAD 1'CH
VIDEO HEAD 2CH
VIDEO HEAD 1CH
FLYING ERASE HEAD
CN003 13P
CH1' GND
CH1' (Y)
CH1' (X)
CH2 GND
CH2 (Y)
CH2 (X)
CH1 GND
CH1 (Y)
CH1 (X)
FE GND
FE (Y)
FE (X)
GND
PA-24 BOARD
D990 SB01-05CP
LITHIUM BATTERY 3V
(See page 135.) TO FC-25 BOARD CN102
(See page 92.) TO DC-21 BOARD CN500
W990 4P
GRY LI 3V
GRY LI GND
GRY UNREG
GRY UNREG GND
L990 1μH
L991 1μH
F990 1.6A
F991 1.6A
L992 1μH
W992 BATT (+) RED
BATTERY PACK
S990 EDIT
W991 5P
UNREG
UNREG
SP/CP EDIT
UNREG GND
UNREG GND
W992 BATT (−) BLK
CHASSIS
CN006 5P
UNREG
UNREG
SP/CP EDIT
UNREG GND
UNREG GND
C014 0.1
CHASSIS

(POWER), CC-7 (MODE SWITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) SCHEMATIC DIAGRAM

- **Signal path**
  - ➡ : REC Y Signal
  - ➡ : REC CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan servo (speed and phase)		▷	
Ref. signal	➡	➡	▷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IC004 CX2011
POWER OFF
MIX VI
U V W
93 BOARD (1/3)
END SENS
TOP SENS
Q005 TAPE END DETECT
Q006 TAPE TOP DETECT
IC003 LOADING MOTOR DRIVE
Q007 LED DRIVE
CHASSIS
Q054 STARTER
IC004 DRUM MOTOR DRIVE
IC006 FG&PG AMP
TP007
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
IC001 SERVO/MECHANISM CONTROL
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
SWITCH POSITION
CCD-F50 MODEL
(See page 115, 116.)
SS-93 BOARD (1/3) VIDEO, AUDIO BLOCK
Q301 ERASE CURRENT SWITCH
Q302 AMP
Q303 ERASE OSC
BATTERY LEVEL
Q001 5V REG
Q002 5V REG
IC002 VOLTAGE ERROR DETECT
D003
D004
TO VA-42 BOARD

SELECT/CASSETTE IN SWITCH) SCHEMATIC DIAGRAM

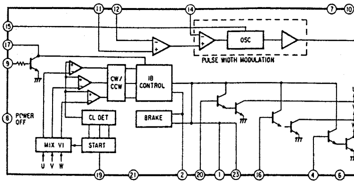
2 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24

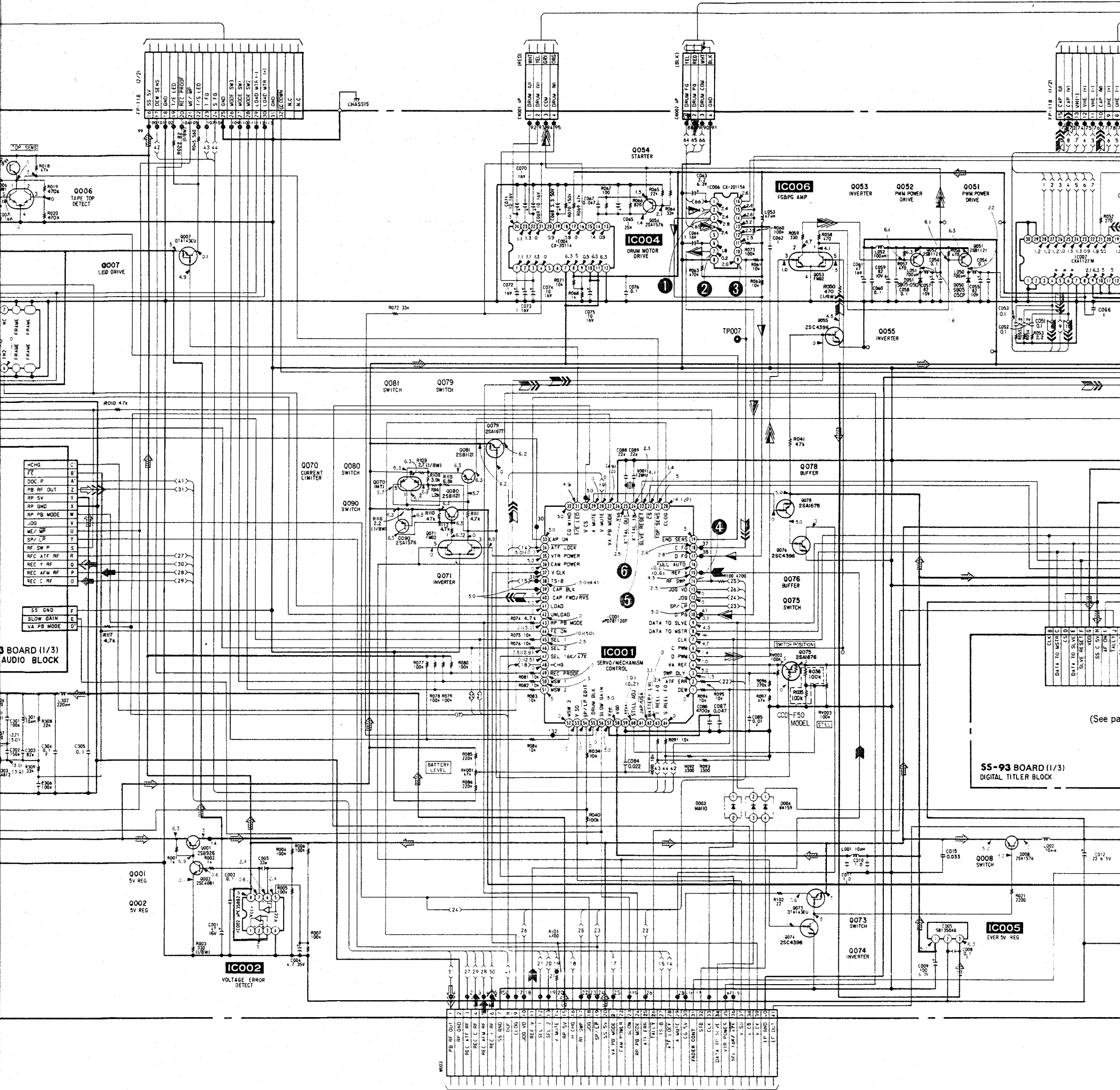
- **Signal path**
  - ➤➤ : REC Y Signal
  - ➤ : REC CHROMA Signal
  - ➤➤➤ : REC Y/CHROMA Signal
  - ⇨⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

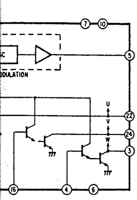
Signal path

	REC	REC/PB	PB
Drum speed servo		➢	
Drum phase servo		➢➢	
Drum servo (speed and phase)		➢➢➢	
Capstan servo (speed and phase)		➢〉〉	
Ref. signal	➧	➧	▷

IC004 CX20114


OSC
PULSE WIDTH MODULATION
CW/CCW
IB CONTROL
POWER OFF
CL DET
BRAKE
MIX VI
START
U V W


FP-118 (2/2)
CHASSIS
CN001 4P
CN002 4P
FP-118 (1/2)
Q006 TAPE TOP DETECT
Q007 LED DRIVE
Q054 STARTER
IC004 DRUM MOTOR DRIVE
IC006 FG&PG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q051 PWM POWER DRIVE
IC007 CXA1127M
Q055 INVERTER
TP007
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
IC001 SERVO/MECHANISM CONTROL
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
CCD-F50 MODEL
BATTERY LEVEL
3 BOARD (1/3)
AUDIO BLOCK
Q001 5V REG
Q002 5V REG
IC002 VOLTAGE ERROR DETECT
D003 MA110
D004 MA159
Q008 SWITCH
Q073 SWITCH
Q074 INVERTER
IC005 EVER 5V REG
SS-93 BOARD (1/3)
DIGITAL TITLER BLOCK
(See pa
CN003



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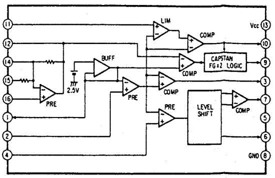
IC006 CX20115A



LIM
COMP
Vcc 13
CAPSTAN FG×2 LOGIC
BUFF
PRE
2.5V
COMP
LEVEL SHIFT
GND 8
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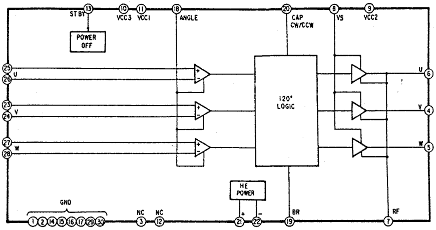
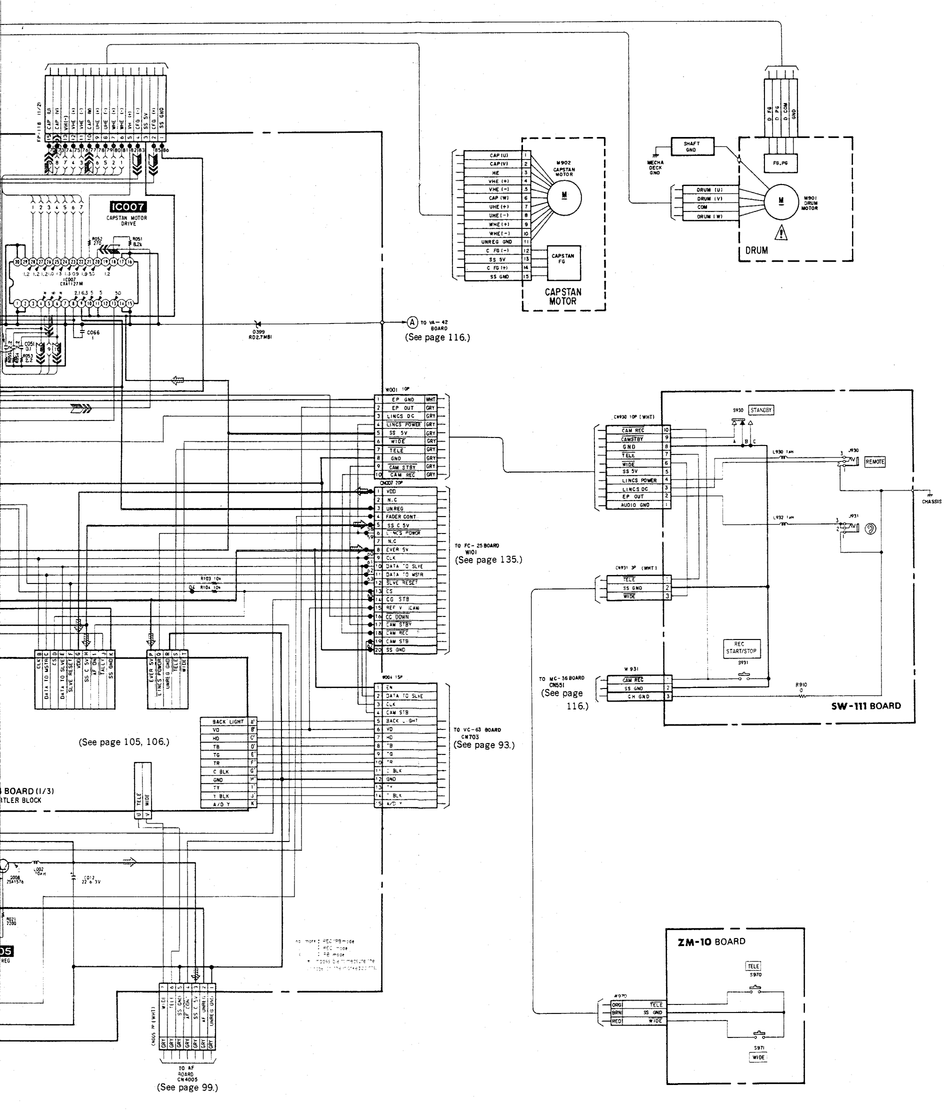
6

IC007 CXA1127M

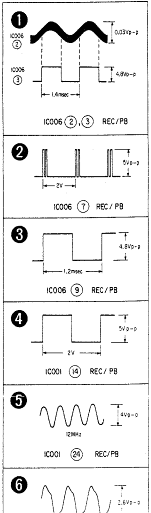


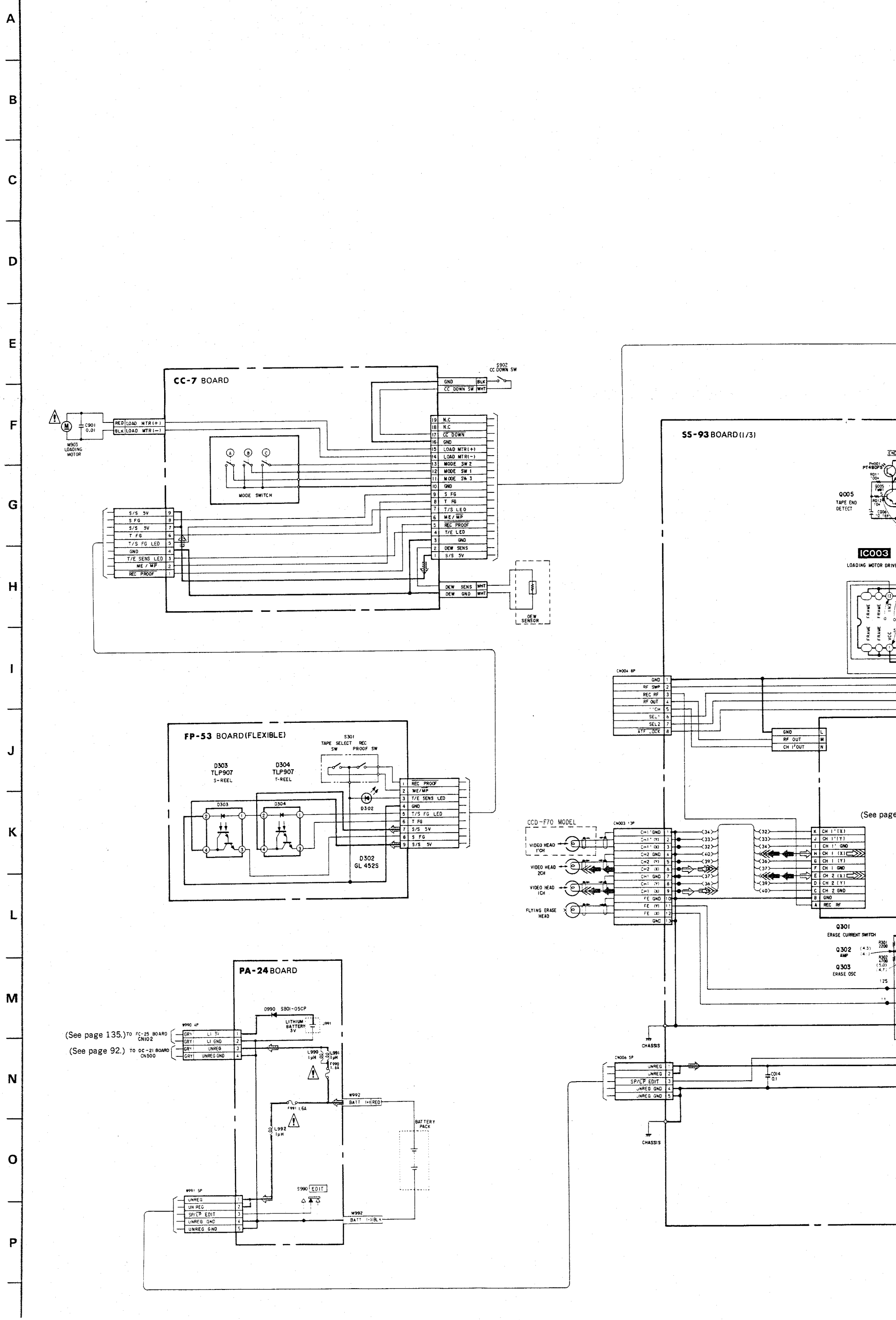
STBY 13
POWER OFF
10 VCC3
11 VCC1
18 ANGLE
20 CAP CW/CCW
8 VS
9 VCC2
U
V
W
25
26
23
24
27
28
120° LOGIC
6
4
5
HE POWER
GND
NC
NC
BR
RF
1 2 14 15 16 17 29 30
3
12
21
22
19
7



FP-118 (1/2)
CAP (U)
CAP (V)
VHE (-)
VHE (+)
CAP (W)
UHE (+)
UHE (-)
WHE (+)
WHE (-)
VH (+)
CFG (-)
SS 5V
CFG (+)
SS GND
IC007
CAPSTAN MOTOR DRIVE
IC007 CXA1127M
R052 270
R051 8.2k
C066
C051
R053 2.2
D399 RD2.7MB1
A TO VA-42 BOARD
(See page 116.)
M902 CAPSTAN MOTOR
CAP (U)
CAP (V)
HE
VHE (+)
VHE (-)
CAP (W)
UHE (+)
UHE (-)
WHE (+)
WHE (-)
UNREG GND
C FG (-)
SS 5V
C FG (+)
SS GND
CAPSTAN FG
CAPSTAN MOTOR
M
SHAFT GND
MECHA DECK GND
D FG
D PG
D COM
GND
FG, PG
DRUM (U)
DRUM (V)
COM
DRUM (W)
M901 DRUM MOTOR
DRUM
W001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
WHT
GRY
CN007 20P
VDD
N.C
UNREG
FADER CONT.
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V (CAM)
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
TO FC-25 BOARD W101
(See page 135.)
R103 10k
R104 10k
Q4
W004 15P
EN
DATA TO SLVE
CLK
CAM STB
BACK LIGHT
VD
HD
TB
TG
TR
C BLK
GND
TY
T BLK
A/D Y
TO VC-63 BOARD CN703
(See page 93.)
CLK
DATA TO MSTR
DATA TO SLVE
SLVE RESET
CS
SS C 5V
AF CON
TALLY
SS GND
EVER 5V
LINCS POWER
UNREG GND
TELE
WIDE
(See page 105, 106.)
BOARD (1/3)
ITLER BLOCK
U TELE
V WIDE
Q008 2SA1576
L002 10μH
C012 22 6.3V
R021 2200
05
REG
CN005 7P (WHT)
WIDE
TELE
SS GND
AF CON
SS C 5V
AF UNREG
UNREG GND
GRY
TO AF BOARD CN4005
(See page 99.)
CN930 10P (WHT)
CAM REC
CAMSTBY
GND
TELE
WIDE
SS 5V
LINCS POWER
LINCS DC
EP OUT
AUDIO GND
S930 STANDBY
A B C
L930 1μH
J930
REMOTE
L932 1μH
J931
CHASSIS
CN931 3P (WHT)
TELE
SS GND
WIDE
REC START/STOP
S931
TO MC-36 BOARD CN551
(See page 116.)
W931
CAM REC
SS GND
CH GND
R910 0
SW-111 BOARD
ZM-10 BOARD
TELE
S970
S971
WIDE
W970
ORG
BRN
RED
TELE
SS GND
WIDE

SS-93 BOARD

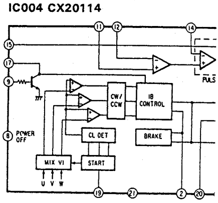


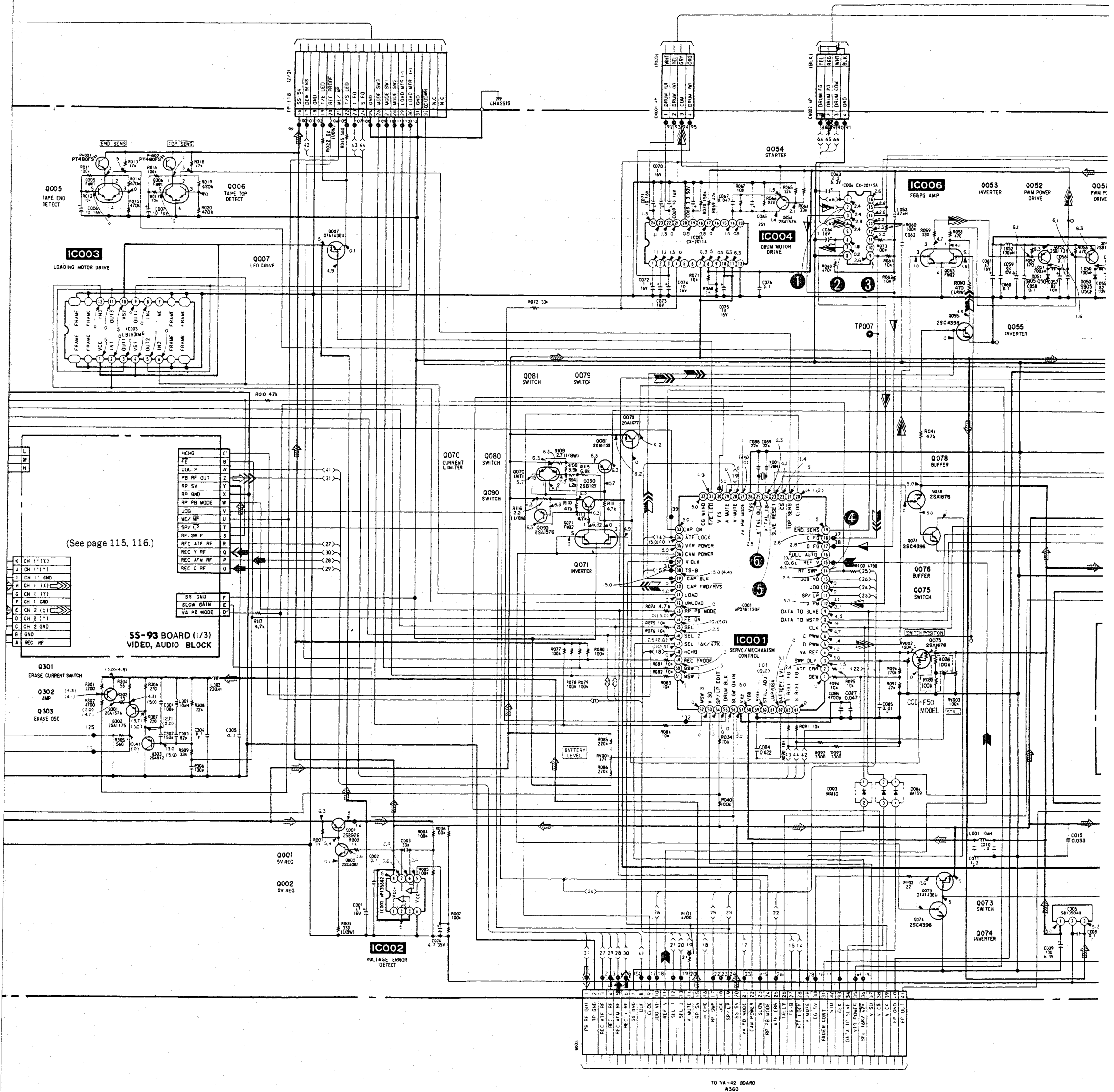

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
CC-7 BOARD
S902 CC DOWN SW
GND
CC DOWN SW
BLK
WHT
M903 LOADING MOTOR
C901 0.01
RED
BLK
LOAD MTR(+)
LOAD MTR(−)
MODE SWITCH
19 N.C
18 N.C
17 CC DOWN
16 GND
15 LOAD MTR(+)
14 LOAD MTR(−)
13 MODE SW 2
12 MODE SW 1
11 MODE SW 3
10 GND
9 S FG
8 T FG
7 T/S LED
6 ME/MP
5 REC PROOF
4 T/E LED
3 GND
2 DEW SENS
1 S/S 5V
S/S 5V
S FG
T FG
T/S FG LED
T/E SENS LED
ME/MP
REC PROOF
DEW SENS
DEW GND
DEW SENSOR
FP-53 BOARD(FLEXIBLE)
S301 TAPE SELECT SW REC PROOF SW
D303 TLP907 S-REEL
D304 TLP907 T-REEL
D302
D302 GL 452S
PA-24 BOARD
(See page 135.) TO FC-25 BOARD CN102
(See page 92.) TO OC-21 BOARD CN500
W990 4P
LI 3V
LI GND
UNREG
UNREG GND
D990 SB01-05CP
LITHIUM BATTERY 3V
L990 1μH
L991 1μH
F990 1.6A
F991 1.6A
L992 1μH
W992
BATT (+) RED
BATT (−) BLK
BATTERY PACK
S990 EDIT
W991 5P
SP/LP EDIT
SS-93 BOARD(1/3)
Q005 TAPE END DETECT
IC003
LOADING MOTOR DRIVE
CN004 8P
GND
RF SWP
REC RF
RF OUT
SEL1
SEL2
ATF LOCK
RF OUT
CH 1'OUT
CCD-F70 MODEL
VIDEO HEAD 1'CH
VIDEO HEAD 2CH
VIDEO HEAD 1CH
FLYING ERASE HEAD
CN003 13P
FE GND
(See page
CH 1'(X)
CH 1'(Y)
CH 1' GND
CH 1 (X)
CH 1 (Y)
CH 1 GND
CH 2 (X)
CH 2 (Y)
CH 2 GND
REC RF
Q301 ERASE CURRENT SWITCH
Q302 AMP
Q303 ERASE OSC
CHASSIS
CN006 5P
C014 0.1

- **Signal path**
  - ⇛ : REC Y Signal
  - ➡ : REC CHROMA Signal
  - ⇛ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⊳	
Drum servo (speed and phase)		⊳	
Capstan servo (speed and phase)		⊳	
Ref. signal	➡	➡	▷


IC004 CX20114
CW/CCW
IB CONTROL
POWER OFF
CL DET
BRAKE
MIX VI
START
U V W
PULS


CHASSIS
END SENS
TOP SENS
Q005 TAPE END DETECT
Q006 TAPE TOP DETECT
Q007 LED DRIVE
IC003 LOADING MOTOR DRIVE
IC003 LB1638M
Q054 STARTER
IC004 DRUM MOTOR DRIVE
IC006 FGBPG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q055 INVERTER
TP007
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
SWITCH POSITION
CCD-F50 MODEL
STILL
IC001 SERVO/MECHANISM CONTROL
(See page 115, 116.)
SS-93 BOARD (1/3) VIDEO, AUDIO BLOCK
Q301 ERASE CURRENT SWITCH
Q302 AMP
Q303 ERASE OSC
BATTERY LEVEL
D003 MA110
Q001 5V REG
Q002 5V REG
IC002 VOLTAGE ERROR DETECT
Q073 SWITCH
Q074 INVERTER
TO VA-42 BOARD
(See page 116.)

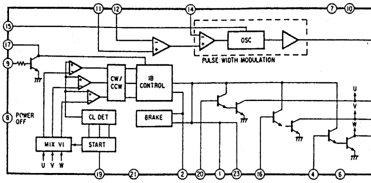
- **Signal path**

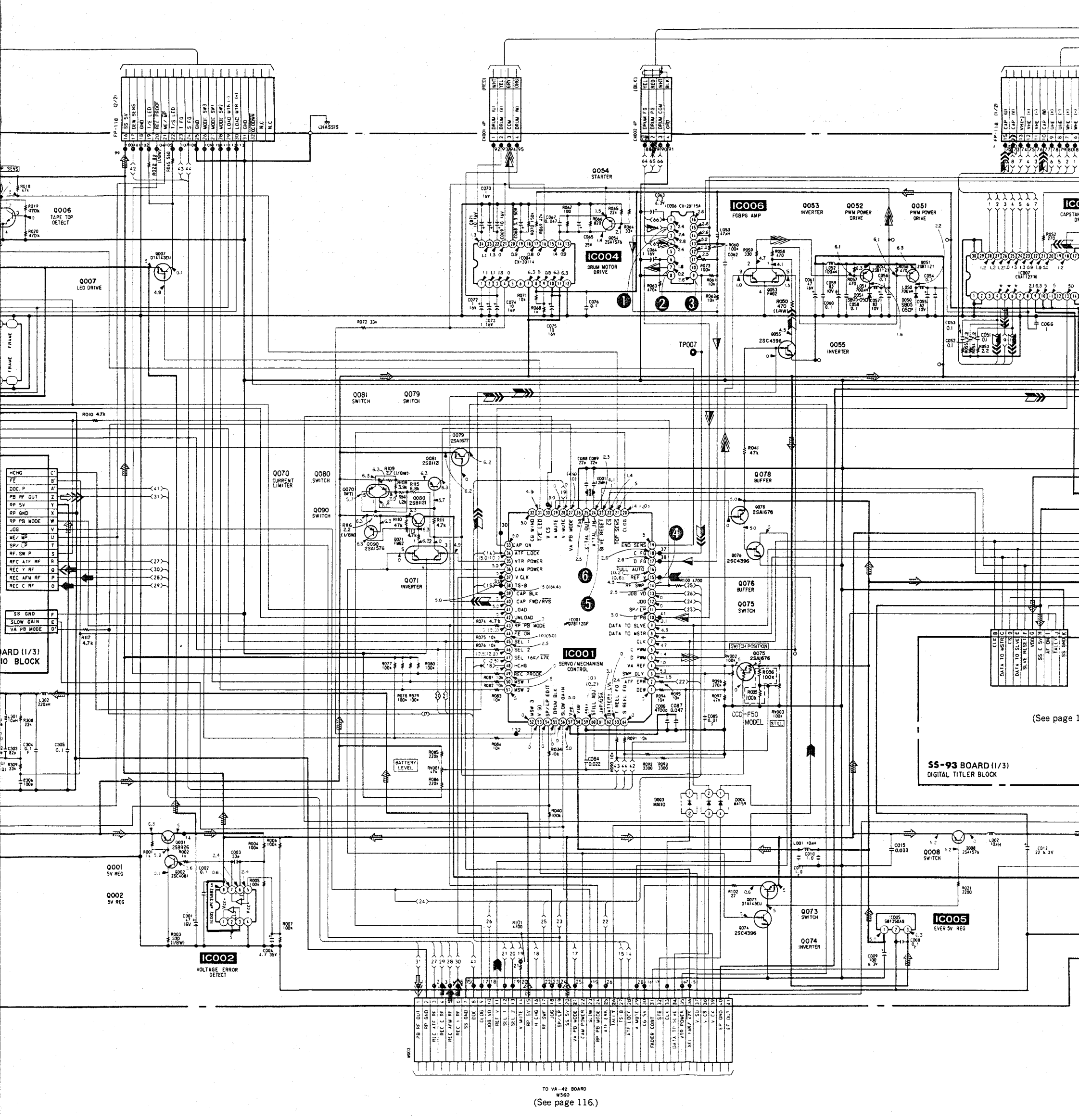
➾ : REC Y Signal
➾ : REC CHROMA Signal
➾ : REC Y/CHROMA Signal
⇨ : PB Y/CHROMA Signal
➡ : REC AUDIO Signal
⇨ : PB AUDIO Signal

Signal path

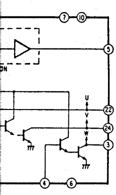
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan servo (speed and phase)		▷	
Ref. signal	▶	▷	▷

IC004 CX20114

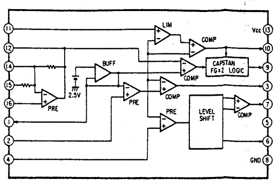

PULSE WIDTH MODULATION
OSC
CW/CCW
1B CONTROL
CL DET
BRAKE
MIX VI
START
POWER OFF
U V W


FP-118 (2/2)
CHASSIS
CN001 4P
CN002 4P
DRUM FG
DRUM PG
DRUM COM
Q054 STARTER
IC004 DRUM MOTOR DRIVE
IC006 FGBPG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q051 PWM POWER DRIVE
Q055 INVERTER
TP007
IC007 CAPSTAN
Q006 TAPE TOP DETECT
Q007 LED DRIVE
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
IC001 SERVO/MECHANISM CONTROL
BATTERY LEVEL
CCD-F50 MODEL
SS-93 BOARD (1/3) DIGITAL TITLER BLOCK
(See page 1
D003 MA110
D004 MA159
Q001 5V REG
Q002 5V REG
IC002 VOLTAGE ERROR DETECT
Q008 SWITCH
Q073 SWITCH
Q074 INVERTER
IC005 EVER 5V REG
BOARD (1/3) IO BLOCK
TO VA-42 BOARD W360
(See page 116.)

SERVO/SYSTEM CONTROL

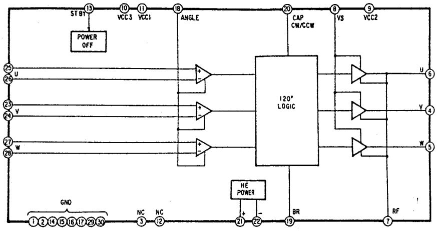


IC006 CX20115A

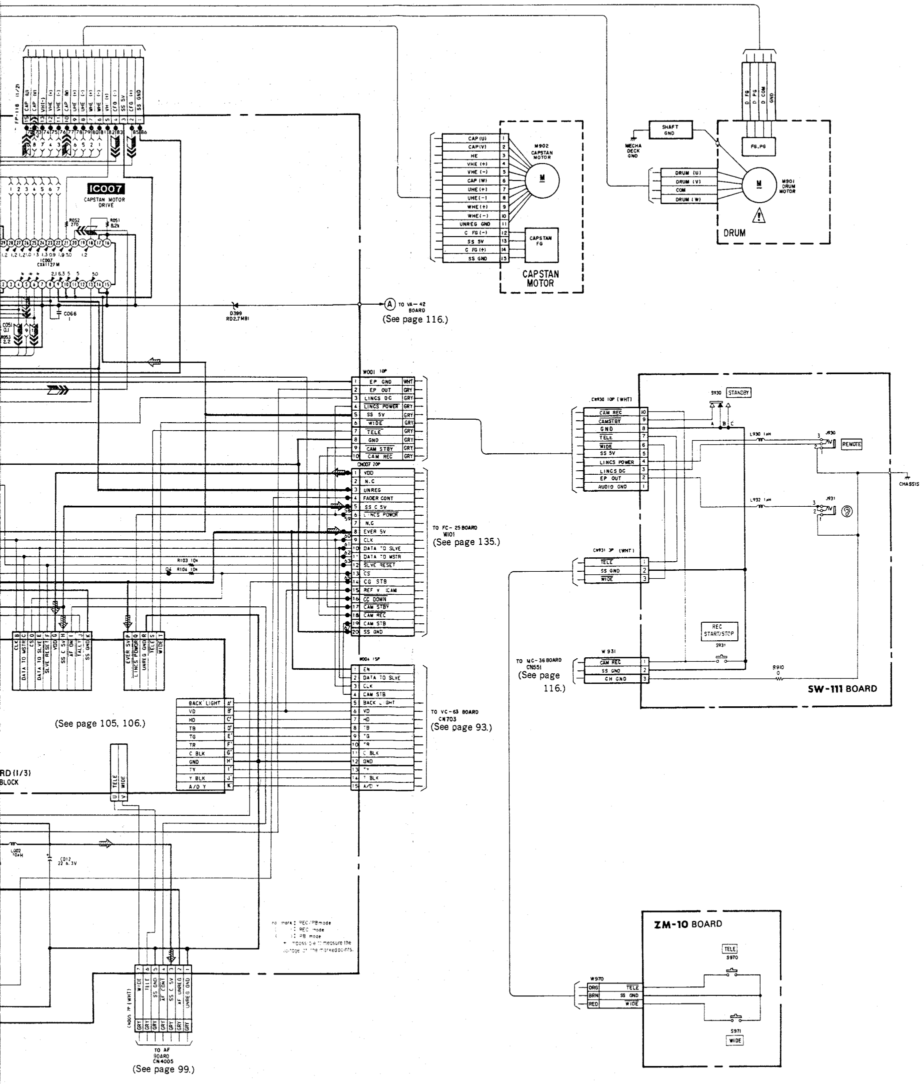


LIM
COMP
Vcc
CAPSTAN FG×2 LOGIC
BUFF
COMP
2.5V
PRE
PRE
COMP
PRE
LEVEL SHIFT
COMP
GND

IC007 CXA1127M

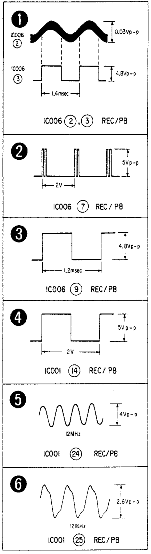


STBY
VCC3
VCC1
ANGLE
CAP CW/CCW
VS
VCC2
POWER OFF
U
V
W
120° LOGIC
HE POWER
GND
NC
NC
BR
RF



FP-118 (1/2)
IC007 CAPSTAN MOTOR DRIVE
IC007 CXA1127M
D399 RD2.7MB1
TO VA-42 BOARD
(See page 116.)
M902 CAPSTAN MOTOR
CAP (U)
CAP (V)
HE
VHE (+)
VHE (-)
CAP (W)
UHE (+)
UHE (-)
WHE (+)
WHE (-)
UNREG GND
C FG (-)
SS 5V
C FG (+)
SS GND
CAPSTAN FG
CAPSTAN MOTOR
D FG
D PG
D COM
GND
SHAFT GND
MECHA DECK GND
FG,PG
DRUM (U)
DRUM (V)
COM
DRUM (W)
M901 DRUM MOTOR
DRUM
W001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
CN007 20P
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V CAM
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
TO FC-25 BOARD W101
(See page 135.)
W004 15P
EN
DATA TO SLVE
CLK
CAM STB
BACK LIGHT
VD
HD
TB
TG
TR
C BLK
GND
TY
Y BLK
A/D Y
TO VC-63 BOARD CN703
(See page 93.)
(See page 105, 106.)
RD (1/3)
BLOCK
R103 10k
R104 10k
CN930 10P (WHT)
CAM REC
CAMSTBY
GND
TELE
WIDE
SS 5V
LINCS POWER
LINCS DC
EP OUT
AUDIO GND
S930 STANDBY
L930 1μH
J930
REMOTE
L932 1μH
J931
CHASSIS
CN931 3P (WHT)
TELE
SS GND
WIDE
REC START/STOP S931
TO MC-36 BOARD CN551
(See page 116.)
W931
CAM REC
SS GND
CH GND
R910 0
SW-111 BOARD
ZM-10 BOARD
TELE S970
W970
ORG
BRN
RED
TELE
SS GND
WIDE
S971 WIDE
CN005 7P (WHT)
WIDE
TELE
SS GND
AF CONT
SS C 5V
UNREG
UNREG GND
TO AF BOARD CN4005
(See page 99.)
L002 10μH
C012 22 6.3V
C066
C051
R053 2.2
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
* : Impossible to measure the voltage of the marked points.

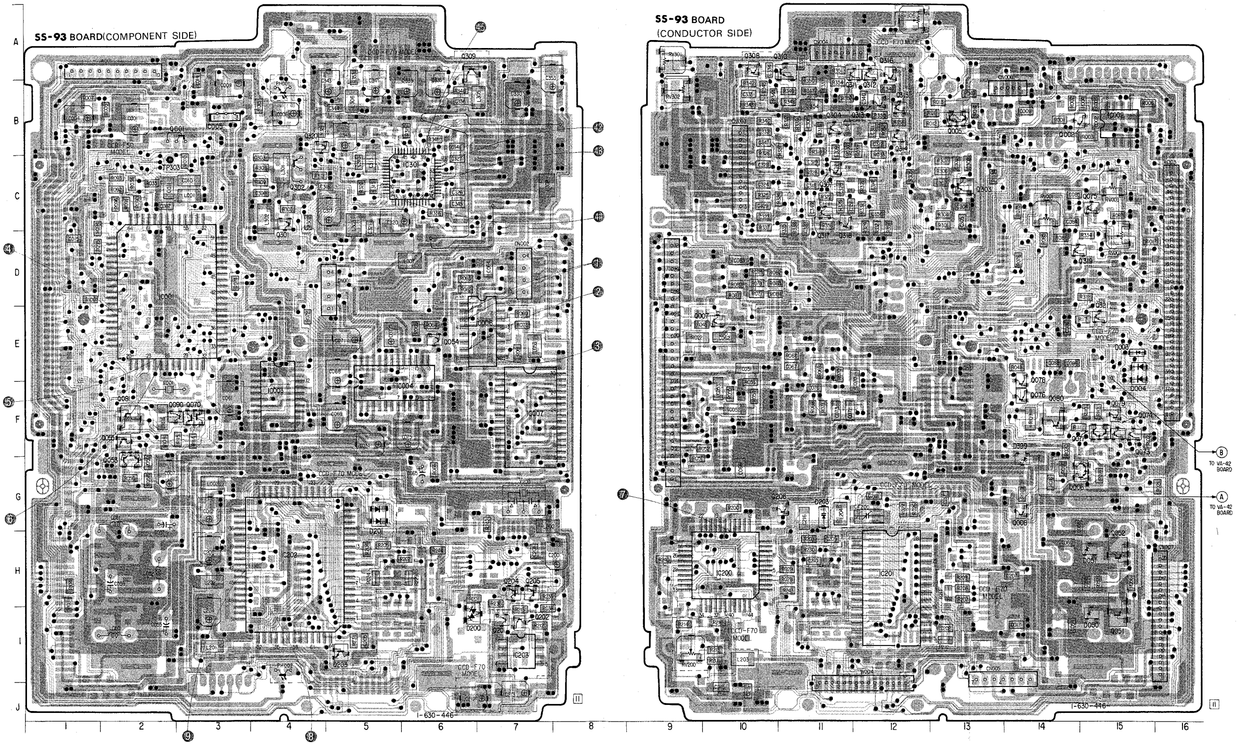
SS-93 BOARD



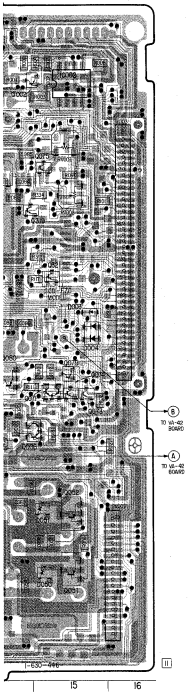
SS-93 (SERVO/SYSTEM CONTROL), SW-111 (START/STOP SWITCH, STANDBY SWITCH, IN/OUT JACK), ZM-10 (ZOOM SWITCH), PA-24 (POWER), CC-7 (MODE SWITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) PRINTED WIRING BOARDS

—Ref. No. SS-93 BOARD ; 2,000 series, SW-111, ZM-10, PA-24, CC-7, FP-53 BOARDS ; 3,000 series—

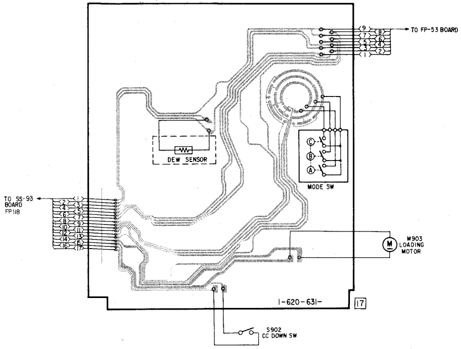
D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D201	G-5
D203	G-11
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC201	H-12
IC202	H-4
IC203	I-7
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q201	I-7
Q202	I-7
Q203	I-5
Q204	H-7
Q205	H-7
Q206	G-11
Q301	C-4
Q302	C-4
Q303	C-13
Q304	B-11
Q307	C-11
Q308	A-10
Q309	A-6
Q310	A-11
Q311	A-12
Q312	A-12
Q313	B-12
Q314	B-12
Q315	B-12
Q316	A-12
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4
Q321	F-15


SS-93 BOARD(COMPONENT SIDE)
SS-93 BOARD
(CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
IC001
IC004
IC202
IC301
IC200
IC201
CCD-F70 MODEL
1-630-446-
TO VA-42 BOARD
TO VA-42 BOARD

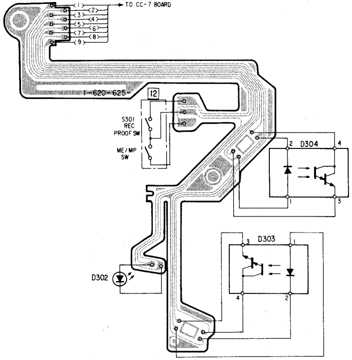
TO
BOA
FP


IC002
D002
Q319
D003
D004
D050
TO VA-42 BOARD
TO VA-42 BOARD
B
A
1-630-446
11
15
16

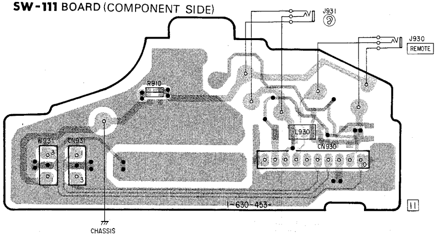
CC-7 BOARD


TO FP-53 BOARD
TO SS-93 BOARD FP118
DEW SENSOR
MODE SW
C
B
A
M903 LOADING MOTOR
1-620-631-
17
S902 CC DOWN SW

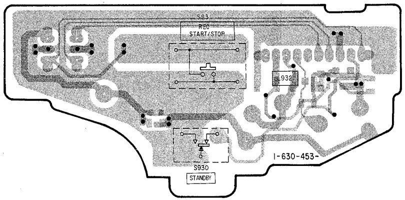
FP-53BOARD (FLEXIBLE)


TO CC-7 BOARD
1-620-625-
12
S301 REC PROOF SW
ME/MP SW
D304
D303
D302

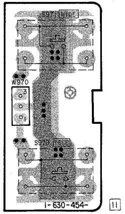
SW-111 BOARD (COMPONENT SIDE)


J931
J930
REMOTE
R910
W93
CN931
L930
CN930
1-630-453-
11
CHASSIS

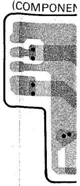
SW-111 BOARD (CONDUCTOR SIDE)


S93
REC START/STOP
L932
S930
STANDBY
1-630-453-
11

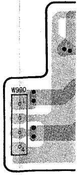
ZM-10 BOARD

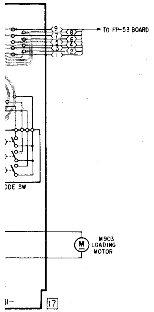

S97 WIDE
W970
S970
1-630-454-
11

PA-24 BOA
(COMPONEN

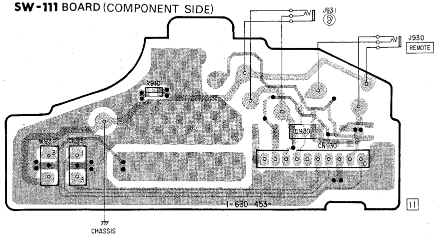


PA-

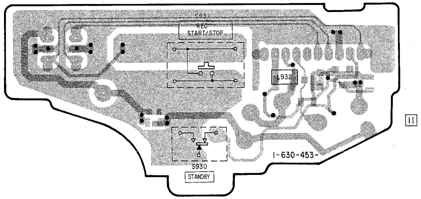


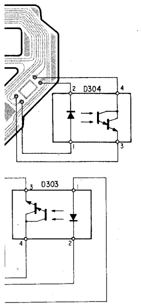

TO FP-53 BOARD
9
8
7
6
5
4
3
2
1
DE SW
M903
LOADING
MOTOR
17

SW-111 BOARD (COMPONENT SIDE)

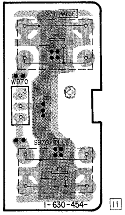

J931
J930
REMOTE
R910
W931
CN931
L930
CN930
10
CHASSIS
1-630-453-
11

SW-111 BOARD (CONDUCTOR SIDE)

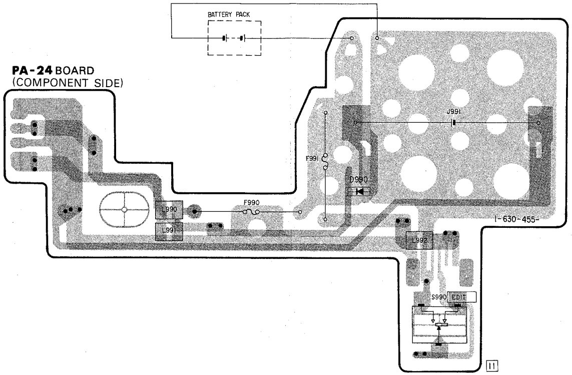

S931
REC
START/STOP
L932
S930
STANDBY
1-630-453-
11


D304
2
4
1
3
D303
3
1
4
2

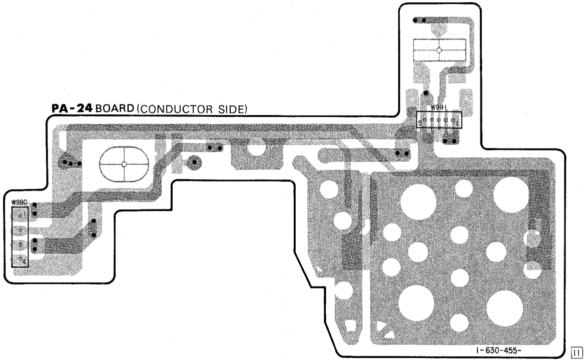
ZM-10 BOARD


S971
WIDE
W970
3
1
S970
TELE
1-630-454-
11

PA-24 BOARD
(COMPONENT SIDE)


BATTERY PACK
J991
F991
D990
F990
L990
L991
L992
S990
EDIT
1-630-455-
11

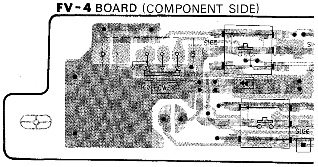
PA-24 BOARD (CONDUCTOR SIDE)


W991
5
1
W990
1
3
5
4
1-630-455-
11

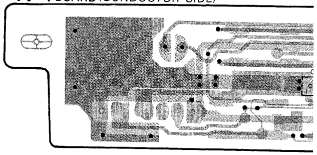
FC-25 (MODE CONTROL), FV-4 (POWER SWITCH, VT

—Ref. No. FC-25, FV-4, FD-12, EJ-9 BOARDS ; 4,000 serie

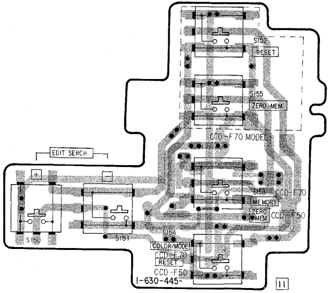
FV-4 BOARD (COMPONENT SIDE)


S165
SI
S160 POWER
S166

FV-4 BOARD (CONDUCTOR SIDE)



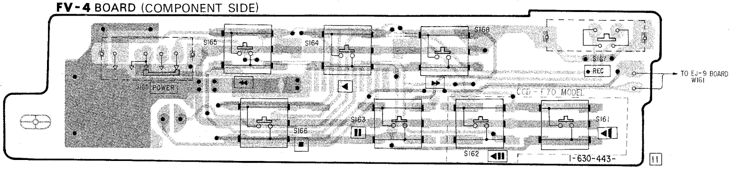
FD-12 BOARD (COMPONEN


S152
RESET
S155
ZERO MEM
CCD-F70 MODEL
EDIT SERCH
+
−
S158
MEMORY
ZERO MEM
CCD-F70
CCD-F50
S150
S151
S154
COLOR/MODE
CCD-F70
RESET
CCD-F50
1-630-445-
11

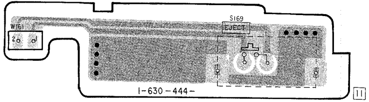
FC-25 (MODE CONTROL), FV-4 (POWER SWITCH, VTR FUNCTION SWITCH), FD-12 (CAMERA DATA FUNCTION SWITCH), EJ-9 (EJECT SWITCH) PRINTED WIRING BOARDS

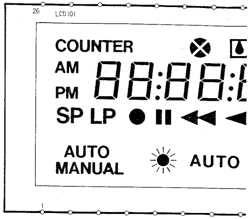
—Ref. No. FC-25, FV-4, FD-12, EJ-9 BOARDS ; 4,000 series—

FV-4 BOARD (COMPONENT SIDE)

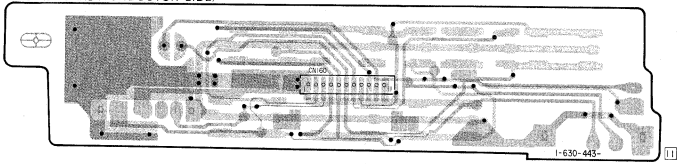

S165
S164
S168
S167
REC
S160 POWER
TO EJ-9 BOARD W161
CCD-F70 MODEL
S166
S163
S162
S161
1-630-443-
11

EJ-9 BOARD (COMPONENT SIDE)

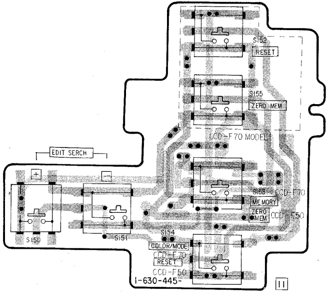

W161
S169
EJECT
1-630-444-
11


26
LCD101
COUNTER
AM
PM
88:88:
SP LP
AUTO
MANUAL
AUTO

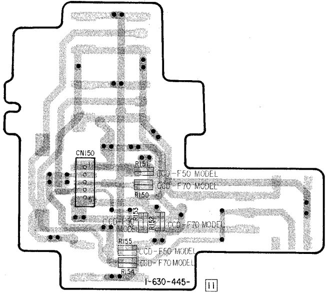
FV-4 BOARD (CONDUCTOR SIDE)


CN160
1-630-443-
11

FD-12 BOARD (COMPONENT SIDE)

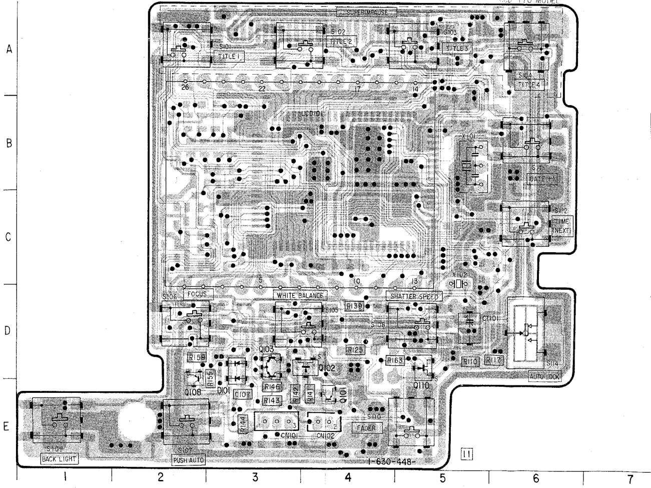

S152
RESET
S155
ZERO MEM
CCD-F70 MODEL
EDIT SERCH
+
−
S153
MEMORY
ZERO MEM
CCD-F70
CCD-F50
S150
S151
S154
COLOR/MODE
CCD-F70
RESET
CCD-F50
1-630-445-
11

FD-12 BOARD (CONDUCTOR SIDE)

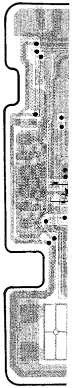

CN150
R151
CCD-F50 MODEL
CCD-F70 MODEL
R150
R153
R152
CCD-F70 MODEL
R155
CCD-F50 MODEL
CCD-F70 MODEL
R154
1-630-445-
11

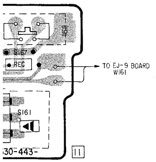
D101	D-3
D103	C-8
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5

FC-25 BOARD (COMPONENT SIDE)

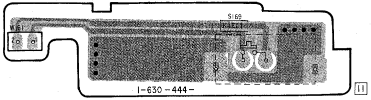

CCD-F70 MODEL
SUPERIMPOSE
S101
TITLE 1
S102
TITLE 2
S103
TITLE 3
S104
TITLE 4
26
22
14
LCD101
X101
DATE
S112
TIME NEXT
X102
S106
FOCUS
WHITE BALANCE
S105
SHATTER SPEED
S108
R139
CT101
R158
Q103
Q102
R129
R163
R110
R112
S114
AUTO LOCK
R155
Q108
D101
Q107
R146
R143
R142
R141
Q101
Q110
R144
CN101
CN102
FADER
S110
S109
BACK LIGHT
S107
PUSH AUTO
1-630-448-
11
A
B
C
D
E
1
2
3
4
5
6
7

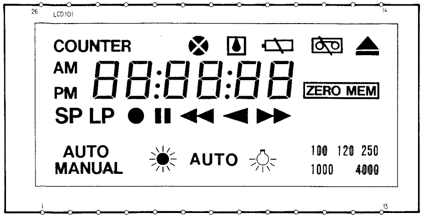
FC-25 BO

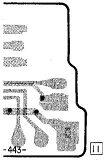



S167
REC
S161
TO EJ-9 BOARD
W161
630-443-
11

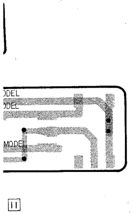
EJ-9 BOARD (COMPONENT SIDE)


W161
S169
EJECT
1-630-444-
11


26
LCD101
14
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
1
13



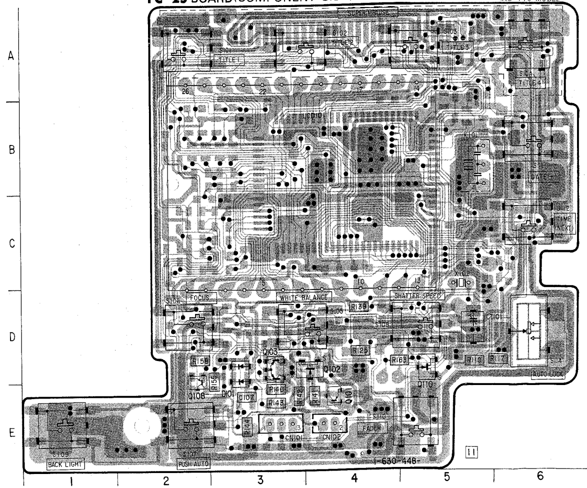
E)


ODEL
ODEL
MODE
11

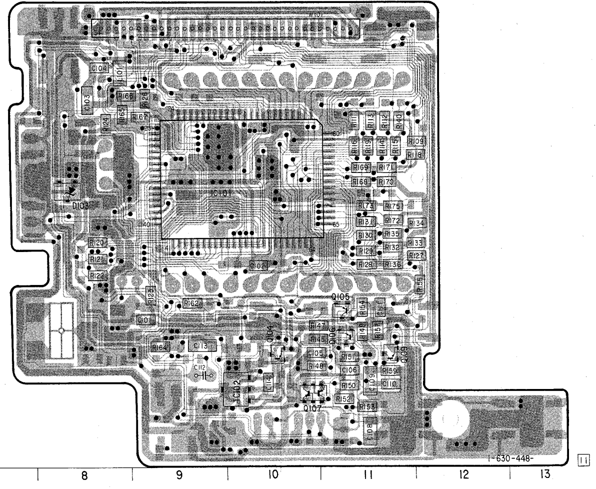
FC-25 BOARD(COMPONENT SIDE)

CCD-F70 MODEL

D101	D-3
D103	C-8
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5


A
B
C
D
E
S101
TITLE1
S102
TITLE2
S103
TITLE3
S104
TITLE4
LCD101
26
22
14
13
S106
FOCUS
WHITE BALANCE
SHATTER SPEED
TIME
NEXT
S114
AUTO LOCK
Q103
Q108
D101
Q102
Q101
Q110
CN101
CN102
FADER
S109
BACK LIGHT
S107
PUSH AUTO
1-630-448-
11
1
2
3
4
5
6

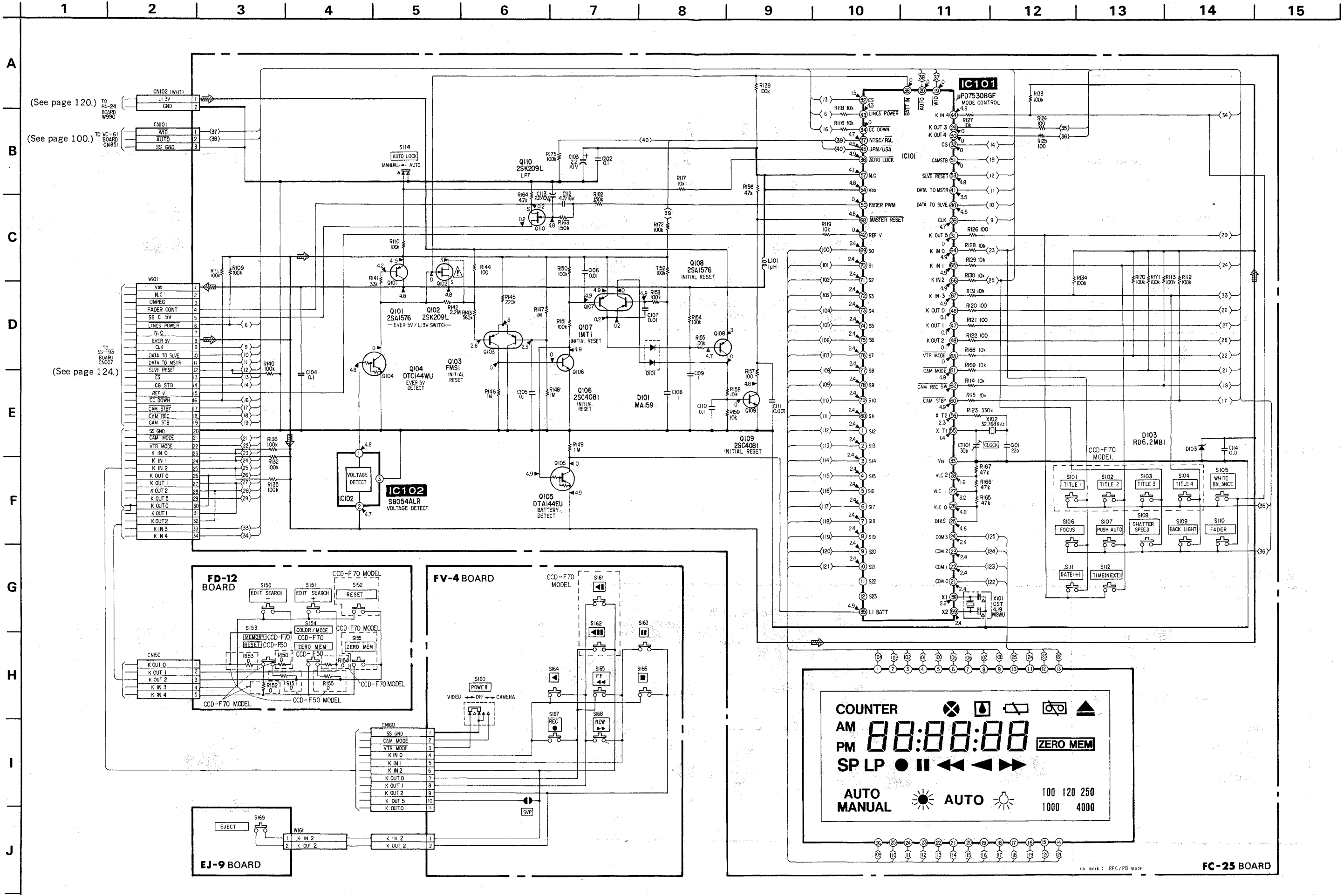
FC-25 BOARD (CONDUCTOR SIDE)


IC101
D103
C104
Q105
Q104
Q106
Q109
Q107
IC102
1-630-448-
11
7
8
9
10
11
12
13

MODE CONTROL MODE CONTROL

FC-25 (MODE CONTROL), FV-4 (POWER SWITCH, VTR FUNCTION SWITCH), FD-12 (CAMERA DATA FUNCTION SWITCH), EJ-9 (EJECT SWITCH) SCHEMATIC DIAGRAM

—Ref. No. FC-25, FV-4, FD-12, EJ-9 BOARDS ; 4,000 series—

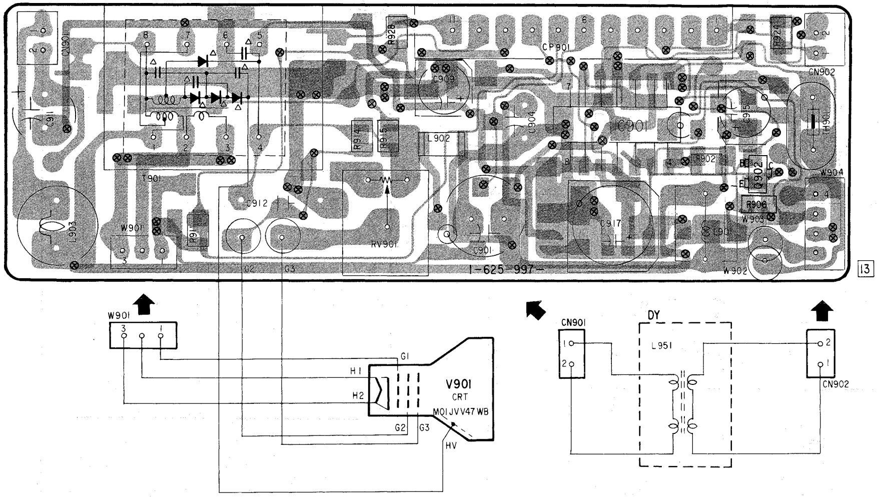

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
(See page 120.) TO PA-24 BOARD W990
CN102 (WHT)
LI 3V
GND
(See page 100.) TO VC-61 BOARD CN851
CN101
WID
AUTO
SS GND
TO SS-93 BOARD CN007
(See page 124.)
W101
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V
CC DOWN
CAM STBY
CAM REC
CAM STB
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K IN 3
K IN 4
S114
AUTO LOCK
MANUAL AUTO
Q110
2SK209L
LPF
Q101
2SA1576
Q102
2SK209L
— EVER 5V / LI3V SWITCH —
Q104
DTC144WU
EVER 5V DETECT
Q103
FMS1
INITIAL RESET
Q107
IMT1
INITIAL RESET
Q106
2SC4081
INITIAL RESET
D101
MA159
Q108
2SA1576
INITIAL RESET
Q109
2SC4081
INITIAL RESET
Q105
DTA144EU
BATTERY DETECT
IC102
S8054ALR
VOLTAGE DETECT
L101
1μH
IC101
μPD75308GF
MODE CONTROL
X101
32.768KHz
X101
CST 4.19 MGWU
CLOCK
D103
RD6.2MB1
CCD-F70 MODEL
S101 TITLE 1
S102 TITLE 2
S103 TITLE 3
S104 TITLE 4
S105 WHITE BALANCE
S106 FOCUS
S107 PUSH AUTO
S108 SHATTER SPEED
S109 BACK LIGHT
S110 FADER
S111 DATE(+)
S112 TIME(NEXT)
FD-12 BOARD
S150 EDIT SEARCH −
S151 EDIT SEARCH +
S152 RESET
S153 MEMORY CCD-F70 RESET CCD-F50
S154 COLOR/MODE CCD-F70 ZERO MEM CCD-F50
S155 ZERO MEM
CCD-F70 MODEL
CCD-F50 MODEL
CN150
FV-4 BOARD
S160 POWER
VIDEO OFF CAMERA
S161
S162
S163
S164
S165 FF
S166
S167 REC
S168 REW
CN160
SVP
EJ-9 BOARD
S169 EJECT
W161
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
no mark : REC/PB mode
FC-25 BOARD

VF-13 (VIEWFINDER), TL-18 (LED), TL-19(LED) PRINTED WIRING BOARDS

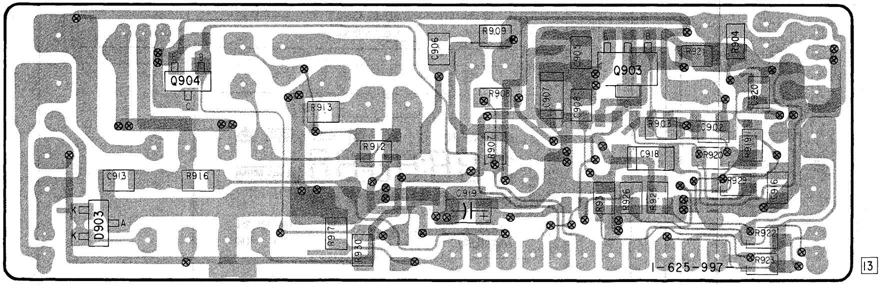
—Ref. No. VF-13, TL-18, TL-19 BOARDS ; 5,000 series—

- ⊗ : Through hole.

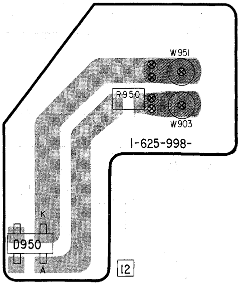
VF-13 BOARD (COMPONENT SIDE)


CN901
T901
C911
L903
W901
R911
C912
G2
G3
R914
R915
RV901
L902
R928
C909
C904
CP901
IC901
C901
C917
R902
Q902
R906
W903
W904
W902
C915
R924
CN902
FH901
1-625-997-
13
W901
G1
H1
H2
V901
CRT
M01JVV47WB
G2
G3
HV
CN901
DY
L951
CN902

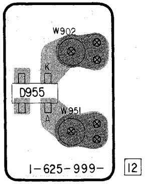
VF-13 BOARD(CONDUCTOR SIDE)


Q904
D903
C913
R916
R913
R912
R917
R930
C906
R909
R908
R907
C919
C907
C908
C905
Q903
R921
R904
R920
R903
C902
C918
R920
R919
R929
C916
R931
R926
R925
R922
R923
1-625-997-
13

TL-18 BOARD (COMPONENT SIDE)

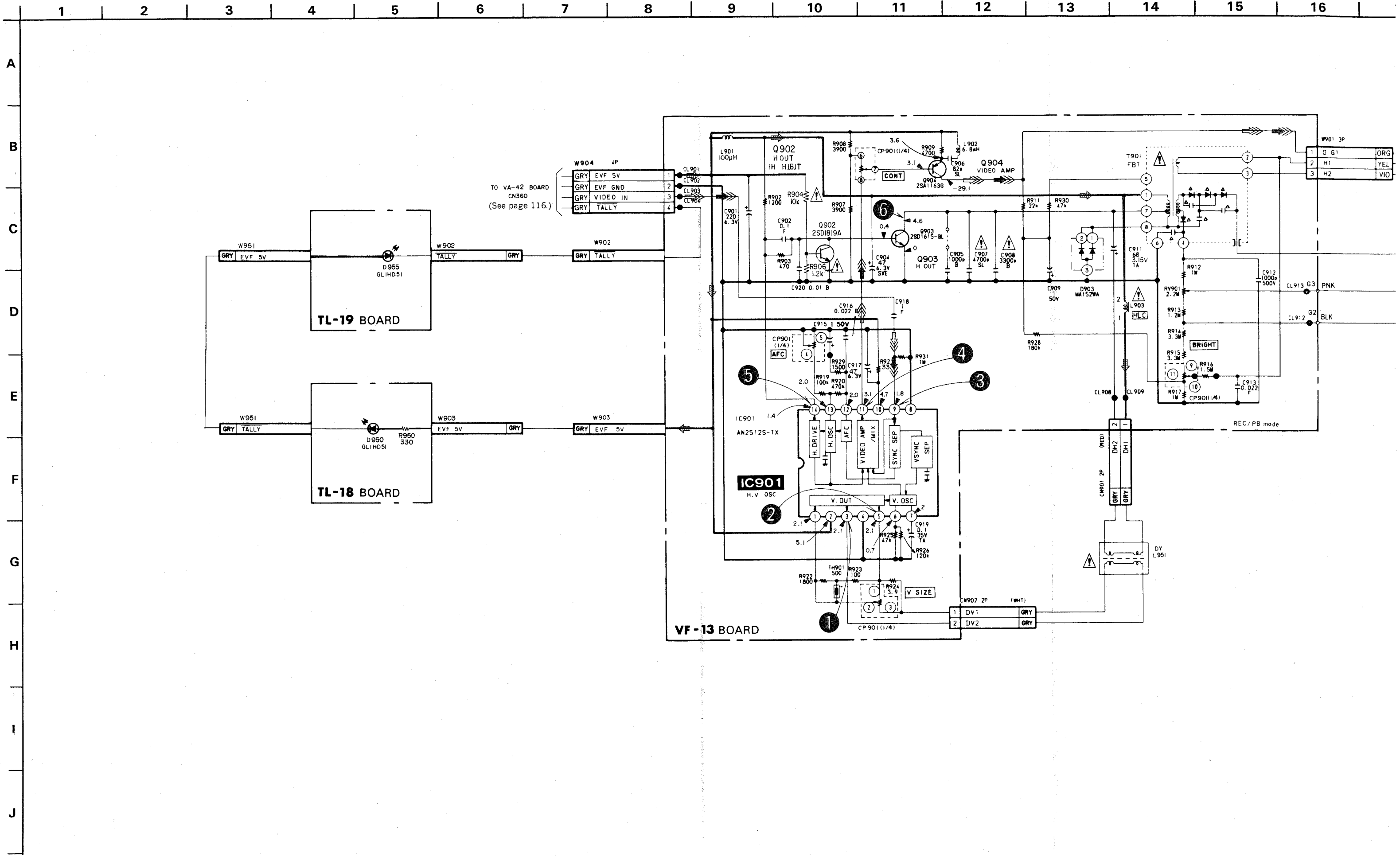

W951
R950
W903
1-625-998-
K
D950
A
12

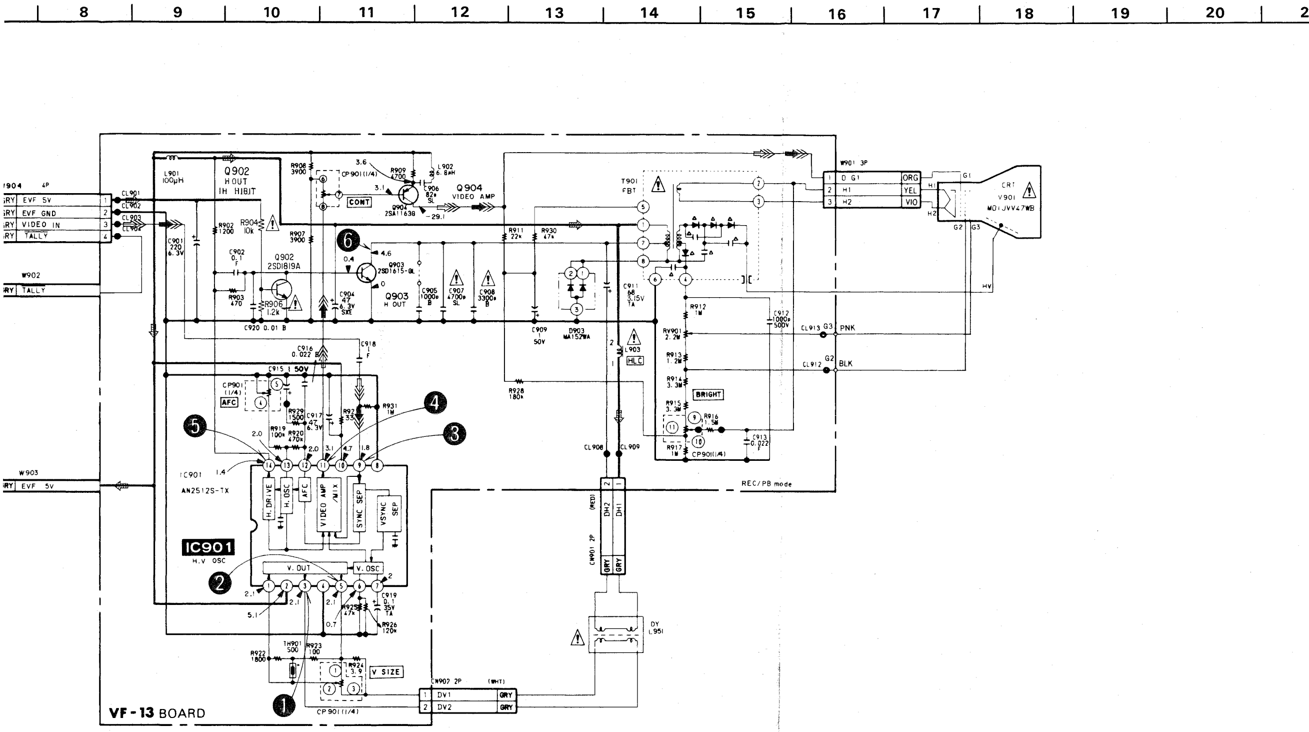
TL-19 BOARD(COMPONENT SIDE)

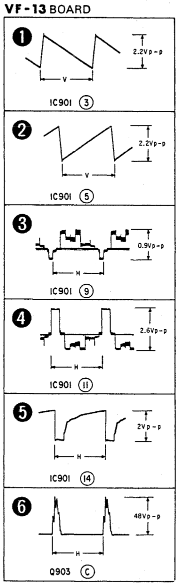

W902
K
D955
W951
A
1-625-999-
12

VF-13 (VIEWFINDER), TL-18 (LED), TL-19(LED) SCHEMATIC DIAGRAM

—Ref. No. VF-13, TL-18, TL-19 BOARDS ; 5,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
TL-19 BOARD
TL-18 BOARD
VF-13 BOARD
W951
GRY EVF 5V
GRY TALLY
D955
GLIHD51
D950
GLIHD51
R950
330
W902
TALLY GRY
W903
EVF 5V GRY
W904 4P
GRY EVF 5V
GRY EVF GND
GRY VIDEO IN
GRY TALLY
TO VA-42 BOARD
CN360
(See page 116.)
CL901
CL902
CL903
CL904
L901
100μH
C901
220
6.3V
Q902
H OUT
1H H.BIT
R902
1200
R904
10k
C902
0.1
F
R903
470
Q902
2SD1819A
R906
1.2k
C920 0.01 B
R908
3900
R907
3900
CP901(1/4)
CONT
R909
4700
L902
6.8μH
C906
82p
SL
Q904
2SA1163G
Q904
VIDEO AMP
3.6
3.1
-29.1
4.6
0.4
0
Q903
2SD1615-GL
Q903
H OUT
C904
47
6.3V
SXE
C905
1000p
B
C907
4700p
SL
C908
3300p
B
R911
22k
R930
47k
C909
1
50V
D903
MA152WA
C911
68
3.15V
TA
L903
HLC
R928
180k
T901
FBT
W901 3P
O G1 ORG
H1 YEL
H2 VIO
R912
1M
C912
1000p
500V
RV901
2.2M
R913
1.2M
R914
3.3M
R915
3.3M
BRIGHT
R916
1.5M
R917
1M
C913
0.022
F
CP901(1/4)
CL913 G3 PNK
CL912 G2 BLK
CL908
CL909
REC/PB mode
CN901 2P
(RED)
DH2
DH1
GRY
GRY
DY
L951
C916
0.022 B
C918
1
F
C915 1 50V
CP901
(1/4)
AFC
R929
1500
C917
47
6.3V
R927
33
R931
1M
R919
100k
R920
470k
2.0
2.0
3.1
4.7
1.8
1.4
IC901
AN2512S-TX
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
IC901
H.V OSC
V. OUT
V. OSC
2.1
2.1
5.1
2.1
0.7
2
C919
0.1
35V
TA
R925
47k
R926
120k
TH901
500
R922
1800
R923
100
R924
3.9
V SIZE
CP901(1/4)
CN902 2P
(WHT)
DV1 GRY
DV2 GRY


8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
W904 4P
EVF 5V
EVF GND
VIDEO IN
TALLY
W902
TALLY
W903
EVF 5V
L901 100μH
Q902 H OUT IH HIBIT
R902 1200
R904 10k
C901 220 6.3V
C902 0.1
Q902 2SD1819A
R903 470
R906 1.2k
C920 0.01 B
R908 3900
R907 3900
CP901(1/4)
CONT
R909 4700
Q904 2SA1163B
L902 6.8mH
C906 82p SL
Q904 VIDEO AMP
-29.1
Q903 2SD1615-GL
Q903 H OUT
C904 47 6.3V
C905 1000p B
C907 4700p SL
C908 3300p B
R911 22k
R930 47k
T901 FBT
D903 MA152WA
C909 1 50V
C911 68 3.15V TA
L903
HLC
R928 180k
R912 1M
RV901 2.2M
R913 1.2M
R914 3.3M
R915 3.3M
BRIGHT
R916 1.5M
R917 1M
CP901(1/4)
C913 0.022
C912 1000p 500V
CL913 G3 PNK
CL912 G2 BLK
W901 3P
G1 ORG
H1 YEL
H2 VIO
CRT V901 M01JVV47WB
HV
CL908
CL909
CN901 2P
DH2
DH1
GRY
DY L951
REC/PB mode
C916 0.022
C918 1 F
C915 1 50V
CP901 (1/4)
AFC
R929 1500
C917 47 6.3V
R931 1M
R919 100k
R920 470k
IC901 AN2512S-TX
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
IC901 H.V OSC
V. OUT
V. OSC
C919 0.1 35V TA
R925 47k
R926 120k
R922 1800
TH901 500
R923 100
R924 3.9
V SIZE
CP901(1/4)
CN902 2P
DV1
DV2
VF-13 BOARD



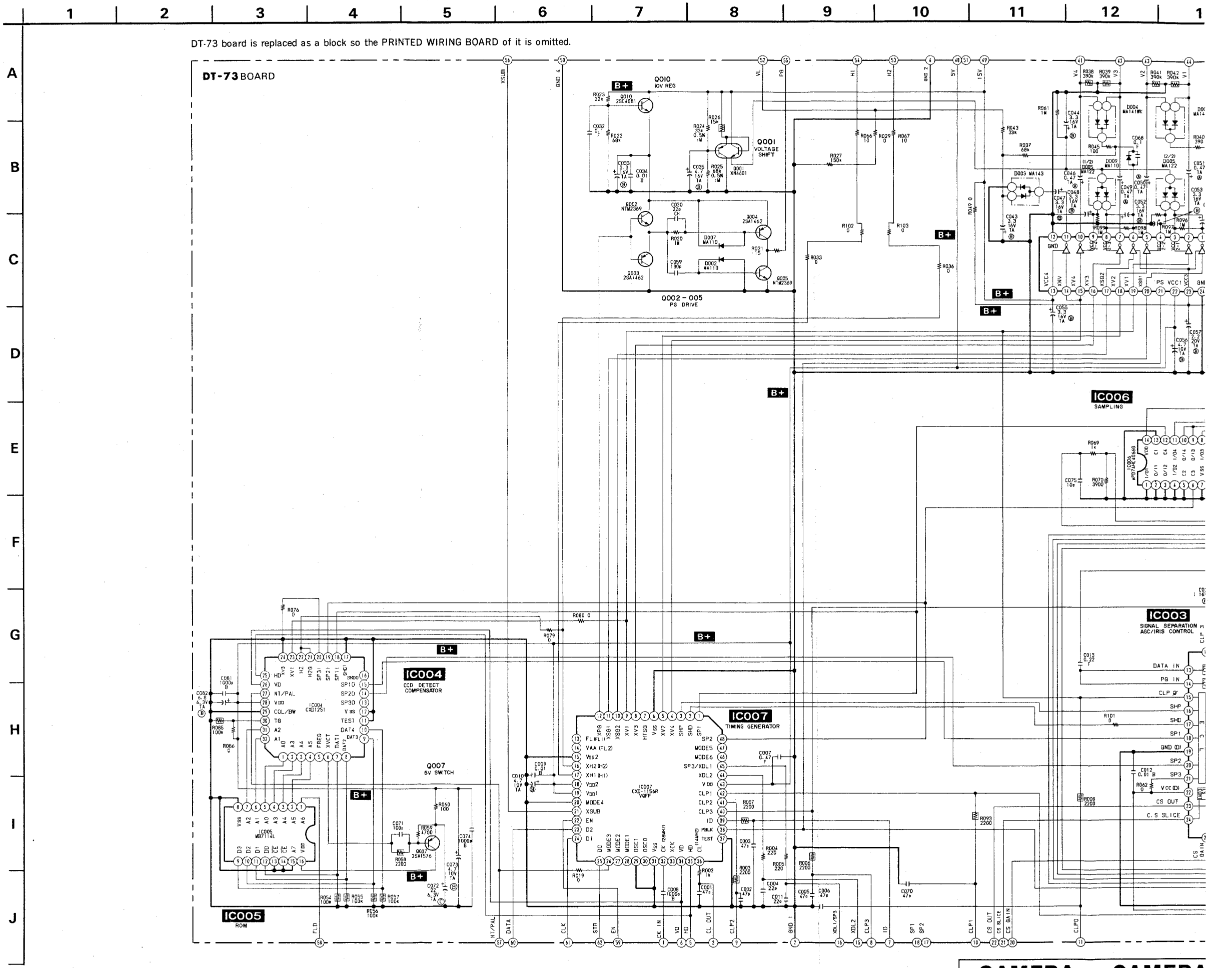
- **Signal path**

➡: REC Y/CHROMA Signal

⇨: PB Y/CHROMA Signal

DT-73 (CCD DRIVE/TIMING GENERATOR)

DT-73 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.



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A
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C
D
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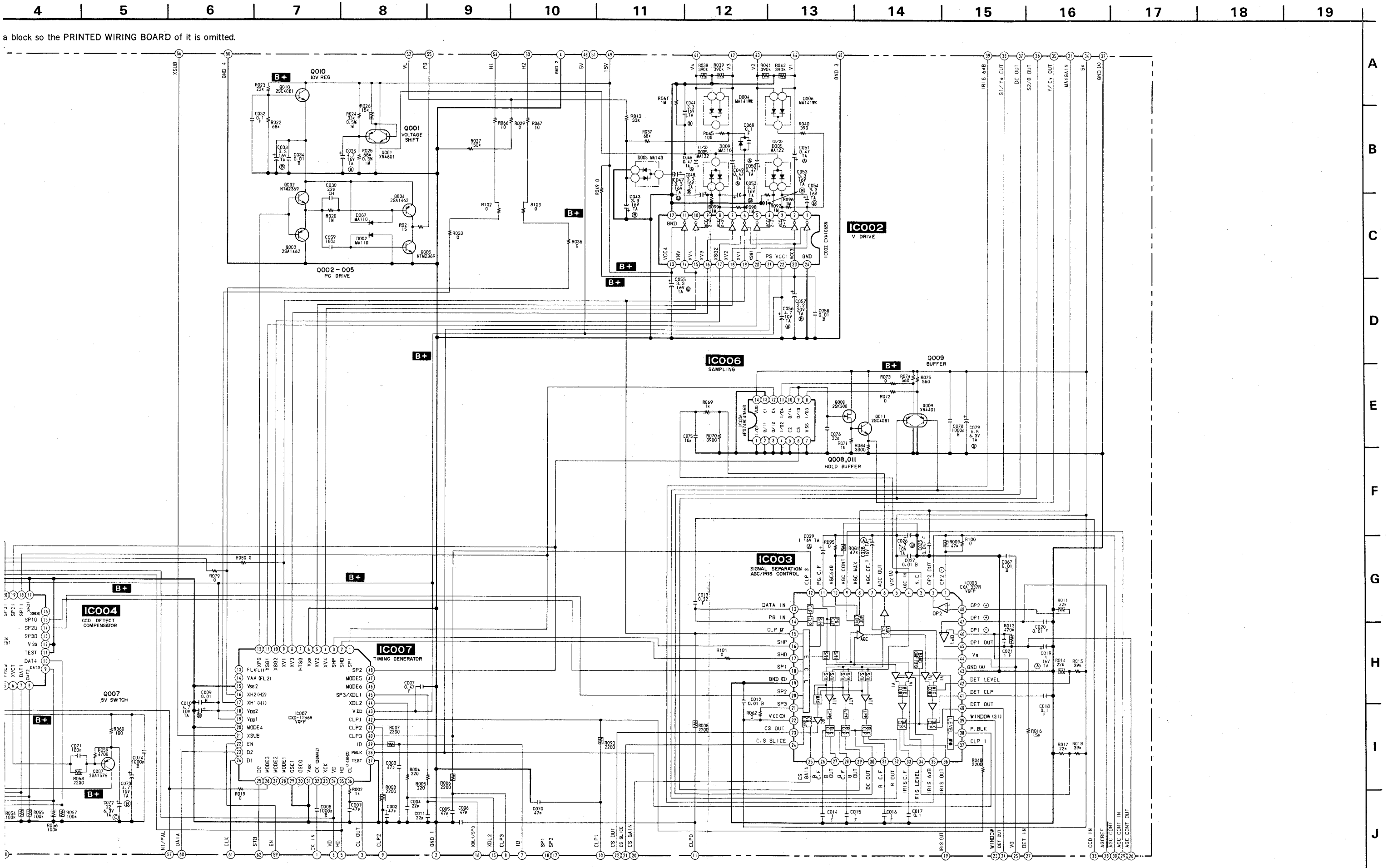
G
H
I
J
DT-73 BOARD
Q010 10V REG
Q001 VOLTAGE SHIFT
Q002 - 005 PG DRIVE
B+
IC006 SAMPLING
IC004 CCD DETECT COMPENSATOR
IC007 TIMING GENERATOR
IC003 SIGNAL SEPARATION AGC/IRIS CONTROL
Q007 5V SWITCH
IC005 ROM
XSUB
GND 4
VL
PG
H1
H2
GND 2
5V
15V
V4
V3
V2
V1
DATA IN
PG IN
CLP
SHP
SHD
SP1
GND (D)
SP2
SP3
VCC (D)
CS OUT
C.S SLICE
FLD
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN
CLPD

a block so the PRINTED WIRING BOARD of it is omitted.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A
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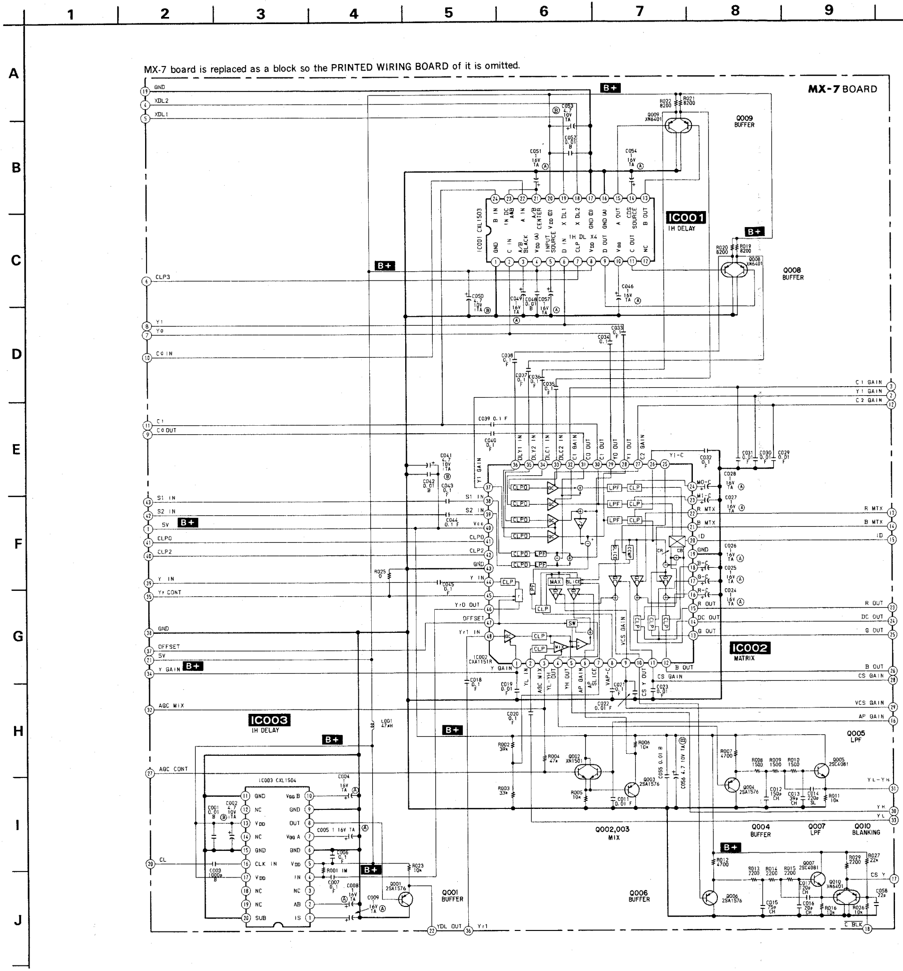
C
D
E
F
G
H
I
J
Q010
10V REG
Q001
VOLTAGE SHIFT
Q002 - 005
PG DRIVE
D004 MA141WK
D006 MA141WK
D003 MA143
IC002
V DRIVE
IC002 CXA1065N
IC006
SAMPLING
Q009
BUFFER
Q008,011
HOLD BUFFER
IC003
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC003 CXA1337R VQFP
IC004
CCD DETECT COMPENSATOR
IC007
TIMING GENERATOR
IC007 CXD-1156R VQFP
Q007
5V SWITCH
B+
XSUB
GND 4
VL
P3
H1
H2
GND 2
5V
15V
V4
V3
V2
V1
GND 3
IRIS 6dB
S1/Ye OUT
DC OUT
S2/B OUT
Y/Cy OUT
MAXGAIN
5V
GND (A)
DATA IN
PG IN
CLP Ø
SHP
SHD
SP1
GND (D)
SP2
SP3
VCC (D)
CS OUT
C.S SLICE
OP2 ⊕
OP1 ⊕
OP1 ⊖
OP1 OUT
Vg
GND (A)
DET LEVEL
DET CLP
DET OUT
WINDOW (G1)
P.BLK
CLP 1
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN
CLP0
IRIS OUT
WINDOW
DET OUT
VG
DET IN
CCD IN
AGCREF
AGC CONT
AGC CONT IN
AGC CONT OUT

MX-7 (CAMERA MATRIX), PR-20 (CAMERA PROCESS)

MX-7 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.



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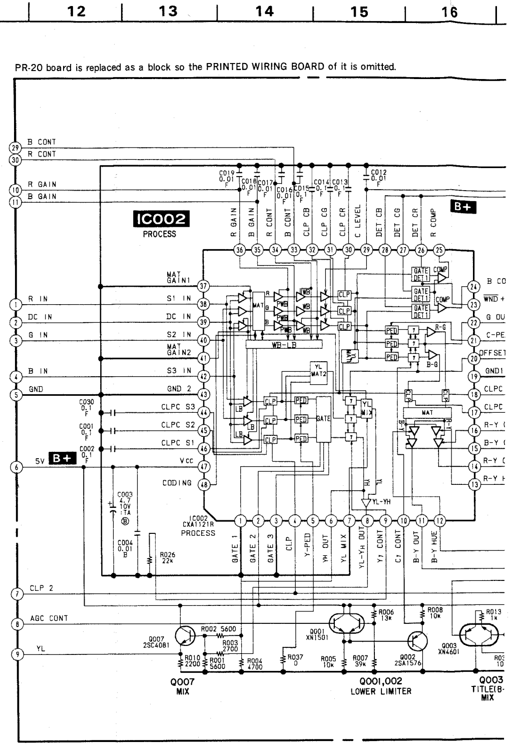
A
B
C
D
E
F
G
H
I
J
MX-7 BOARD
IC001
1H DELAY
IC002
MATRIX
IC003
1H DELAY
Q009 BUFFER
Q008 BUFFER
Q005 LPF
Q002,003 MIX
Q004 BUFFER
Q007 LPF
Q010 BLANKING
Q006 BUFFER
Q001 BUFFER
B+

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.



12
13
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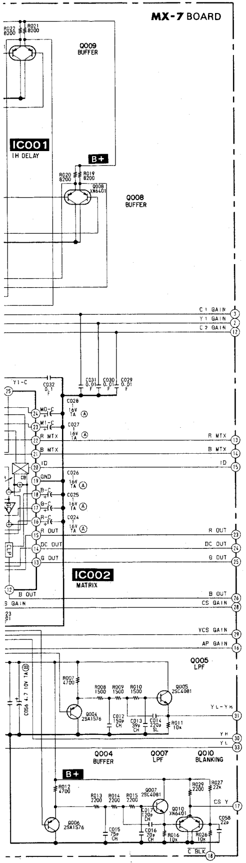
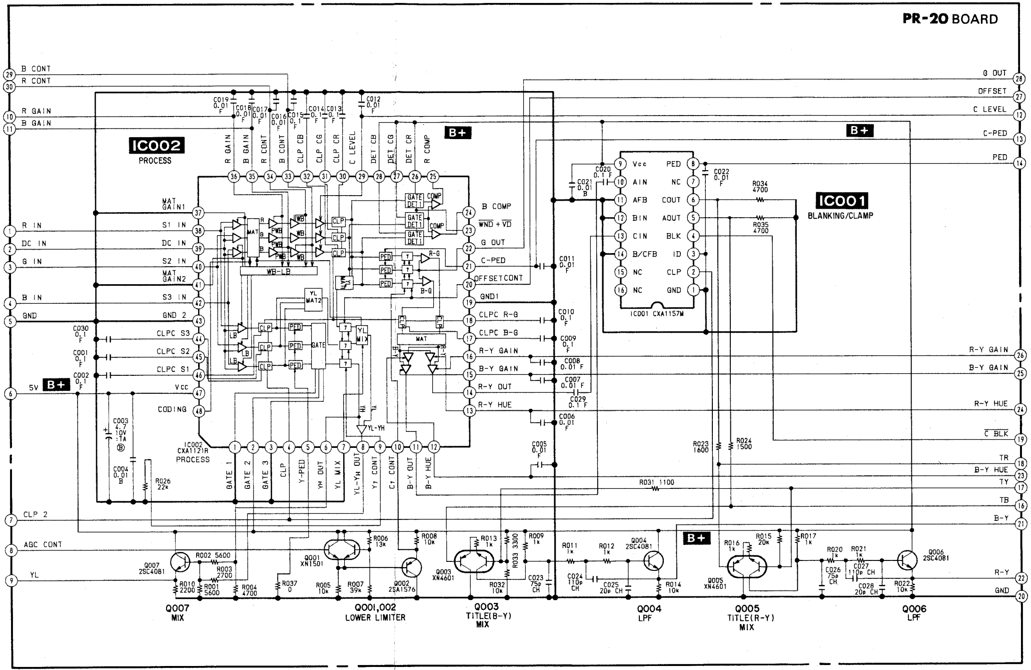
16
IC002
PROCESS
Q007
MIX
Q001,002
LOWER LIMITER
Q003
TITLE(B-
MIX
B+

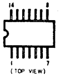

MX-7 BOARD
Q009 BUFFER
IC001 1H DELAY
B+
Q008 BUFFER
R022 8200
R021 8200
R020 8200
R019 8200
Q006 XN6401
C1 GAIN
Y1 GAIN
C2 GAIN
C031 0.01
C030 0.01
C029 0.01
C032 0.1 F
MO-C
MI-C
R MTX
B MTX
ID
GND
B-C
G-C
R-C
R OUT
DC OUT
G OUT
B OUT
CS GAIN
VCS GAIN
AP GAIN
C028 16V 1A
C027 16V 1A
C026 16V 1A
C025 16V 1A
C024 16V 1A
IC002 MATRIX
Q005 LPF
R007 4700
R008 1500
R009 1500
R010 1500
Q005 2SC4081
Q004 2SA1576
C012 150p CH
C013 39p CH
C014 220p SL
R011 10k
C056 4.7 10V TA
YL-YH
YH
YL
Q004 BUFFER
Q007 LPF
Q010 BLANKING
B+
R012 4700
R013 2200
R014 2200
R015 2200
Q007 2SC4081
R029 2200
R027 22k
Q010 XN6401
C017 120p CH
Q006 2SA1576
C015 75p CH
C016 20p CH
R016 10k
R026 10k
C058 22p
CS Y
C BLK

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

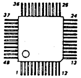

PR-20 BOARD
B CONT
R CONT
R GAIN
B GAIN
R IN
DC IN
G IN
B IN
GND
5V
B+
CLP 2
AGC CONT
YL
IC002 PROCESS
IC002 CXA1121R PROCESS
R GAIN
B GAIN
R CONT
B CONT
CLP CB
CLP CG
CLP CR
C LEVEL
DET CB
DET CG
DET CR
R COMP
MAT GAIN1
S1 IN
DC IN
S2 IN
MAT GAIN2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
Vcc
CODING
B COMP
WND + VD
G OUT
C-PED
OFFSETCONT
GND1
CLPC R-G
CLPC B-G
R-Y GAIN
B-Y GAIN
R-Y OUT
R-Y HUE
GATE 1
GATE 2
GATE 3
CLP
Y-PED
YH OUT
YL MIX
YL-YH OUT
Y7 CONT
C7 CONT
B-Y OUT
B-Y HUE
WB-LB
YL MAT2
MAT
GATE DET1
COMP
CLP
PED
WB
PWB
LB
YL MIX
YL-YH
R-G
B-G
C019 0.01 F
C018 0.01 F
C017 0.01 F
C016 0.01 F
C015 0.1 F
C014 0.1 F
C013 0.1 F
C012 0.01 F
C030 0.1 F
C001 0.1 F
C002 0.1 F
C003 4.7 10V TA
C004 0.01 B
R026 22k
C011 0.01 F
C010 0.1 F
C009 0.1 F
C008 0.01 F
C007 0.01 F
C029 0.1 F
C006 0.01 F
C005 0.01 F
IC001 BLANKING/CLAMP
IC001 CXA1157M
Vcc
AIN
AFB
BIN
CIN
B/CFB
NC
NC
PED
NC
COUT
AOUT
BLK
ID
CLP
GND
C020 0.1 F
C021 0.01 B
C022 0.01 F
R034 4700
R035 4700
B+
R023 1600
R024 1500
R031 1100
G OUT
OFFSET
C LEVEL
C-PED
PED
R-Y GAIN
B-Y GAIN
R-Y HUE
C BLK
TR
B-Y HUE
TY
TB
B-Y
R-Y
GND
R002 5600
R003 2700
R010 2200
R001 5600
R004 4700
Q007 2SC4081
R037 0
Q001 XN1501
R005 10k
R007 39k
R006 13k
R008 10k
Q002 2SA1576
R013 1k
R033 3300
R009 1k
Q003 XN4601
R032 10k
C023 75p CH
R011 1k
R012 1k
C024 110p CH
C025 20p CH
Q004 2SC4081
R014 10k
R016 1k
R015 20k
R017 1k
Q005 XN4601
R020 1k
R021 1k
C026 75p CH
C027 110p CH
C028 20p CH
R022 10k
Q006 2SC4081
Q007 MIX
Q001,002 LOWER LIMITER
Q003 TITLE(B-Y) MIX
Q004 LPF
Q005 TITLE(R-Y) MIX
Q006 LPF

4-3. SEMICONDUCTORS

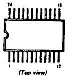
AN2512S
TC40H008F
μpD4066BG


14
8
1
7
(TOP VIEW)

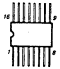
CXA1202R


36
25
37
24
48
13
1
12

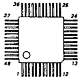
CX20114


24
13
1
12
(Top view)

CX20115A
TC4053BF
μPD6145G-601



CXA1072R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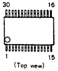
24
48
13
1
12

CXA1127M
CXL1501M


30
16
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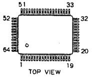
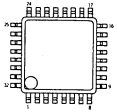
15
(Top view)

CXA1200BQ
MB670493
μPD78112GF-532-3BE


51
33
52
32
64
20
1
19
TOP VIEW

CXA1201Q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32
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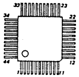
CXA1204Q
μPD7507HG-552-22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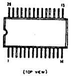
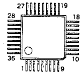
CXK58256MF-12LL


28
15
1
14
(TOP VIEW)

CXD1159Q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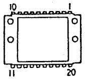
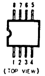
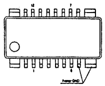


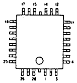
LA7293
MC34182MR
NJM2233AM
NJM3414M
μPC358G2
μPC393G2


8 7 6 5
1 2 3 4
(TOP VIEW)

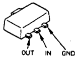
LB1631M



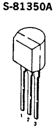
MC146805F2FPSC8253-3F



S-8054ALR-LN-S

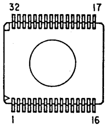


S-81350AG

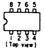


1. Vout
2. Vss
3. Vin

SBX1505



μPC311G2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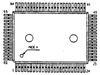
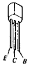
1 2 3 4
(Top view)

μPD75308GF-285-3B9

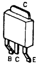


2SA733-K

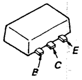


2SA812
2SA1162
2SA1163
2SA1226
2SA1576R
2SA1676
2SA1677
2SC1623
2SC2223-F13
2SC3395
2SC4154
2SC4177
2SC4081R
2SC4397
DTA143EU
DTA144EU
DTC114EU
DTC114TU
DTC144WU
UN5113

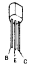
2SA1341



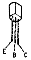
2SA1416-S
2SB804-AW
2SB1121
2SC3646-S
2SD1615



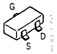
2SA1611-M6



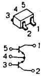
2SB926-T



2SK94-X2
2SK94-X3
2SK300



FMG2
FMW1
XN1213
XN1216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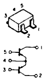
FMS1
FMY3
XN1113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1
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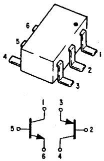
IMD2
XN4601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5
4
1
2
3
1
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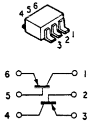
5
2
6
4

IMT1US


4
5
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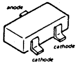
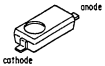
1
2
3
6
1
5
2
4
3

1S2835
1S2836
MA141WA
MA152WA


anode
cathode
cathode

1T33C-01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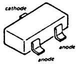
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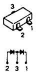

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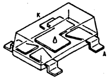

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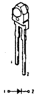

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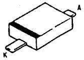

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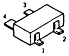
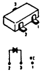


1. cathode
2. cathode
3. anode
4. anode

RD2.7M-B2
RD6.2M-B1
RD9.1M-B1
SB05-05CP



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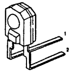
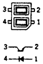
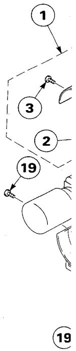


1. Emitter
2. Collector

TLP907-0



5-1. RIGHT



No.	Part N
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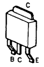
3	3-732-
4	X-3726
	X-3726
5	X-3726
6	*3-713-
7	X-3726
	X-3726
8	3-735-
9	X-3726
10	3-724-
11	*3-697-
12	X-3726
	X-3726
13	3-730-
14	*3-735-

2SA1341



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2SB804-AW
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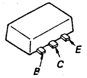
2SC3646-S
2SD1615



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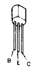

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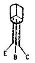

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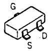
2SK300



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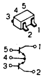
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FMY3
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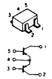
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3
1
2

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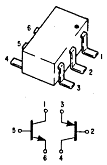
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6 4

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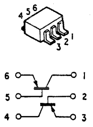
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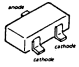
1S2836
MA141WA
MA152WA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cathode
cathode

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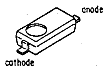
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cathode

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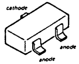
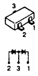

cathode
anode
anode

1SS226



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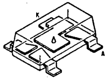

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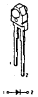

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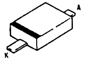
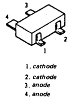


DWA010


3
4
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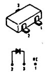
1. cathode
2. cathode
3. anode
4. anode

RD2.7M-B2
RD6.2M-B1
RD9.1M-B1
SB05-05CP



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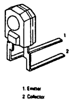
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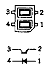
1. Emitter
2. Collector

TLP907-0



SECTION 5
EXPLODED VIEWS

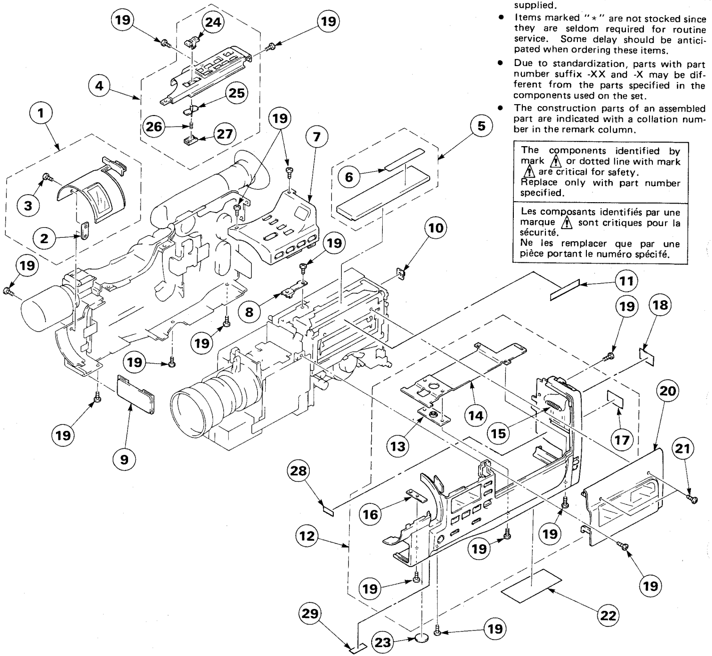
5-1. RIGHT CABINET ASSEMBLY

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.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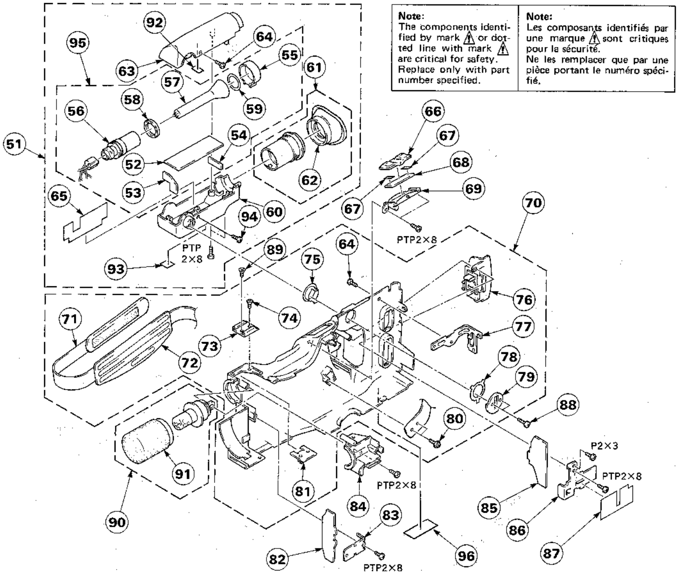
19

No.	Part No.	Description	Remark
1	X-3725-198-1	COVER ASSY, LENS	2, 3
2	3-727-915-01	NUT, PLATE	
3	3-732-988-01	SCREW (M2X2.5)	
4	X-3726-506-1	PANEL (A) ASSY, VTR (CCD-F70)	24-27
	X-3726-527-1	PANEL (B) ASSY, VTR (CCD-F50)	
5	X-3726-505-1	LID ASSY, LS	6
6	*3-713-908-01	LABEL, CAUTION, LS LID	
7	X-3726-507-1	PANEL (A) ASSY, CAMERA (CCD-F70)	
	X-3726-526-1	PANEL (B) ASSY, CAMERA (CCD-F50)	
8	3-735-408-01	BRACKET, CABINET	
9	X-3726-502-1	PLATE ASSY, LIGHT TRANSMISSION	
10	3-724-593-01	KEY TOP	
11	*3-697-539-01	LABEL, CAUTION	
12	X-3726-508-1	CABINET (RIGHT) ASSY (CCD-F70)	13-19
	X-3726-528-1	CABINET (RIGHT) ASSY (CCD-F50)	13-19
13	3-730-899-01	SHEET METAL, TRIPOD FIXED	
14	*3-735-425-01	SHEET METAL, TRIPOD	
15	3-669-440-00	SPRING, TENSION	
16	3-730-898-01	JOINT, L-R	
17	*3-719-683-01	LABEL, BATTERY FITTING	
18	*3-704-256-01	LABEL, CAUTION (CCD-F70, US)	
19	3-719-381-01	SCREW (M2X4)	
20	X-3726-504-1	LID (A) ASSY, CASSETTE (CCD-F70)	
	X-3726-525-1	LID (A) ASSY, CASSETTE (CCD-F50)	
21	3-713-791-01	SCREW (M1.7X5), TAPPING, P2	
22	*3-735-444-01	LABEL, MODEL NUMBER (U/C) (CCD-F70)	
	*3-735-462-01	LABEL, MODEL NUMBER (U/C) (CCD-F50)	
23	3-725-181-01	CAP, LOWER, AF	
24	3-724-586-01	KEY TOP, POWER	
25	3-724-587-51	BUTTON, P LOCK	
26	3-303-973-00	SPRING, COMPRESSION	
27	3-724-503-01	PLATE (B), BLIND, POWER	
28	3-725-142-01	LABEL, FUSE	
29	*3-704-367-01	LABEL (CCD-F70, US)	

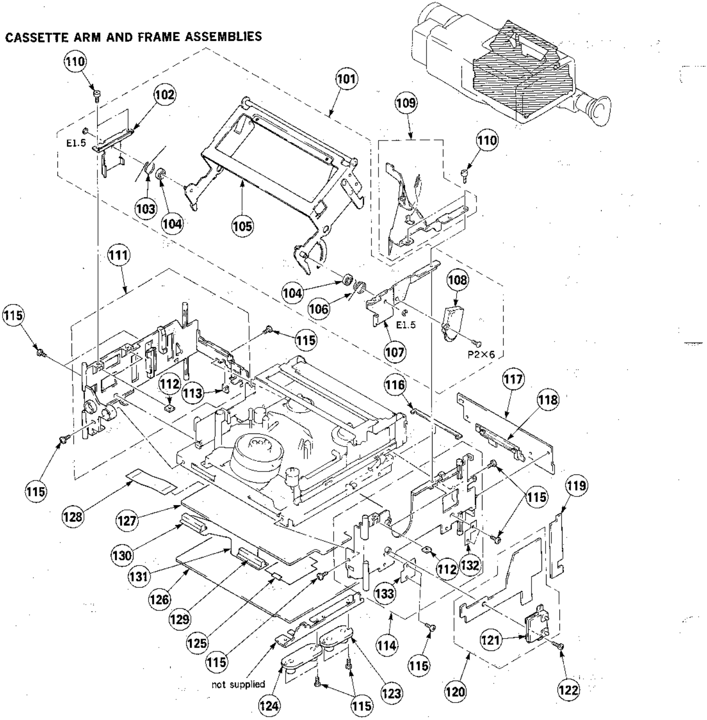
5-2. LEFT CABINET ASSEMBLY

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



No.	Part No.	Description	Remark
51	A-7019-093-A	EVF BLOCK ASSY	52-65, 92-95
52	*A-7061-188-A	VF-13 BOARD, COMPLETE	
53	*A-7070-645-A	TL-18 BOARD, COMPLETE	
54	*A-7070-646-A	TL-19 BOARD, COMPLETE	
55	X-3724-509-1	HOLDER ASSY, CRT	
56	⚠ 1-451-310-21	DEFLECTION YOKE (B/W) (L951)	
57	⚠ 1-546-065-11	CATHODE-RAY TUBE, B/W (MOIJVV47WB)(V901)	
58	3-724-549-01	LOCK, CRT	
59	3-724-570-01	RING, CRT FIXED	
60	A-7080-486-A	CABINET (LOWER) ASSY, EVF	
61	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	62
62	3-733-922-01	EYE CUP	
63	X-3724-508-1	CABINET (UPPER) ASSY, EVF	
64	3-719-381-01	SCREW (M2X4)	
65	*3-725-156-01	INSULATOR (B), EVF	
66	3-724-526-01	BUTTON, ZOOM	
67	*2-532-810-00	CUSHION, 15X5X0.3	
68	*1-630-454-11	ZM-10 BOARD	
69	3-735-420-01	BASE, ZOOM BUTTON	
70	A-7080-772-A	CABINET (LEFT) BLOCK ASSY (CCD-F70)	64, 71-81
70	A-7080-790-A	CABINET (LEFT) BLOCK ASSY (CCD-F50)	64, 71-81
71	*3-724-582-01	BELT, GRIP	
72	3-724-591-01	PAD, GRIP	
73	3-724-511-01	SHOE, ACCESSORY	
74	3-719-831-21	SCREW (M2X4)	
75	3-724-514-01	SLEEVE, EVF	
76	X-3724-564-1	BASE ASSY, SP	
77	3-724-525-01	BRACKET (UPPER), STRAP	
78	3-724-512-01	SPRING	
79	3-724-513-01	PLATE, LOCK	
80	3-669-480-21	+ PTPWH 2	
81	*3-735-407-01	SHEET METAL, ACC	
82	*A-7061-585-A	MC-36 BOARD, COMPLETE (CCD-F70)	
	*A-7061-626-A	MC-36 BOARD, COMPLETE (CCD-F50)	
83	*3-735-406-01	SHEET METAL, MC	
84	3-735-430-01	HOUSING, MICROPHONE	
85	*A-7070-860-A	SW-111 BOARD, COMPLETE	
86	*3-724-569-01	SHEET METAL, SP	
87	*3-725-153-01	SHEET, INSULATING, SHEET METAL	
88	3-713-792-01	SCREW (M2X10)	
89	3-713-787-01	SCREW (M2X4)	
90	*1-542-101-11	MICROPHONE (C-2020) (CCD-F50)	91
	*1-542-125-11	MICROPHONE (C-2027) (CCD-F70)	91
91	3-707-650-01	SCREEN, WIND	
92	*3-703-848-01	LABEL (N), SUB CAUTION	
93	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE	
94	3-713-786-21	SCREW (M2X3)	
95	*A-7019-098-A	CRT ASSY	52-59
96	*3-703-845-01	LABEL (N) (U/C), MAIN CAUTION	

5-3. CASSETTE ARM AND FRAME ASSEMBLIES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not supplied
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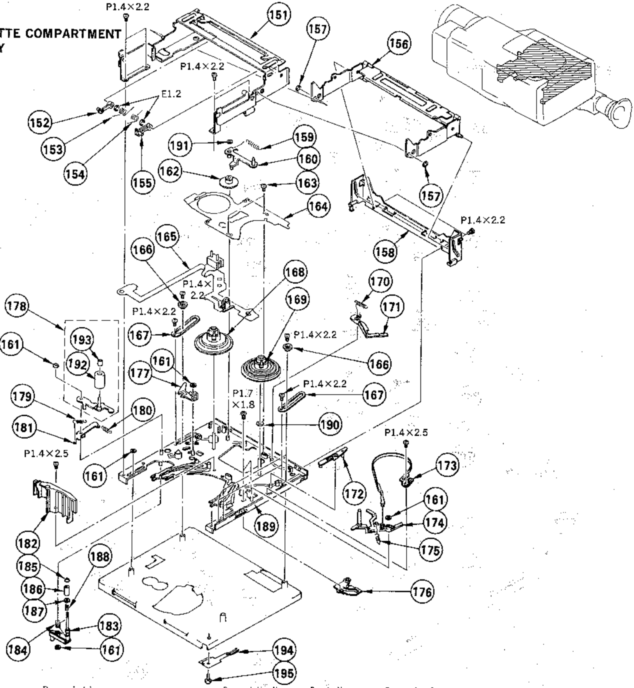
No.	Part No.	Description	Remark
101	A-7040-141-A	ARM BLOCK ASSY (3), CASSETTE	102-108
102	*3-719-606-01	PLATE (T2) (M), SIDE	
103	3-695-582-01	SPRING, TORSION	
104	3-695-512-02	COLLAR, CASSETTE ARM	
105	X-3712-034-4	ARM ASSY (2), CASSETTE	
106	3-695-581-01	SPRING, TORSION	
107	3-695-641-01	PLATE (S2), SIDE	
108	3-681-528-11	DAMPER	
109	A-7040-140-B	GUARD BLOCK ASSY, TAPE	
110	3-719-697-01	SCREW (M1.7X5), SPECIAL HEAD	
111	*X-3724-503-1	FRAME (F) ASSY, MD	112, 113
112	3-716-418-01	NUT, FRAME PLATE	
113	3-718-233-01	NUT, PLATE	
114	*X-3724-504-1	FRAME (R) ASSY, MD	112, 132, 133
115	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	
116	3-725-136-01	REINFORCEMENT, VA-SS	
117	*A-7070-856-A	FV-4 BOARD, COMPLETE (CCD-F70)	
	*A-7070-867-A	FV-4 BOARD, COMPLETE (CCD-F50)	
118	3-724-537-01	HOLDER, FV PC BOARD	
119	*1-630-444-11	EJ-9 BOARD	
120	*A-7070-865-A	PA-24 BOARD, COMPLETE	
121	1-535-658-11	TERMINAL BOARD	
122	3-719-601-01	SCREW (B2X5), TAPPING	
123	1-568-409-11	JACK, PIN 2P (AUDIO IN)	
124	1-537-142-11	TERMINAL BOARD (AUDIO OUT)	
125	*3-726-558-01	PLATE, SHIELD, VA-SS	
126	*A-7061-582-A	VA-42 BOARD, COMPLETE (CCD-F70)	
	*A-7061-623-A	VA-42 BOARD, COMPLETE (CCD-F50)	
127	*A-7061-583-A	SS-93 BOARD, COMPLETE (CCD-F70)	116
	*A-7061-624-A	SS-93 BOARD, COMPLETE (CCD-F50)	116
128	1-574-462-11	CABLE, FLAT (1.0MM PITCH) 15P (CCD-F70)	
129	1-562-879-11	CONNECOR, CARD EDGE 19P	
130	1-562-880-11	CONNECOR, CARD EDGE 15P	
131	1-626-231-11	FP-118 BOARD, FLEXIBLE	
132	*3-725-152-01	SHEET (B), ELECTROSTATIC	
133	*3-725-143-01	SHEET (A), ELECTROSTATIC	

5-4. LS CASSETTE COMPARTMENT ASSEMBLY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P1.4×2.2
E1.2
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P1.4×2.2
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P1.4×2.2
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P1.4×2.2
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P1.4×2.2
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P1.4×2.2
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179
P1.7×1.8
190
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P1.4×2.5
P1.4×2.5
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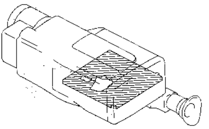
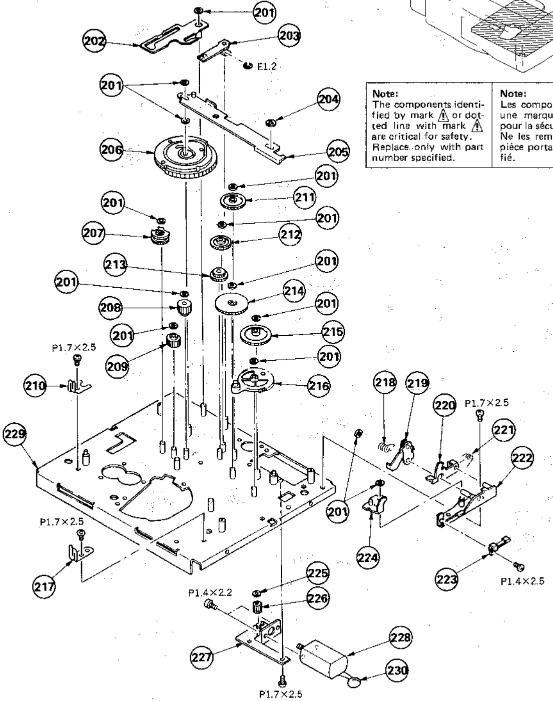
No.	Part No.	Description	Remark
151	X-3695-447-6	COMPARTMENT ASSY, CASSETTE, LS	
152	3-695-595-01	RETAINER (T), CASSETTE	
153	3-695-605-01	SPRING, TORSION	
154	3-695-604-01	SPRING, TORSION	
155	3-695-594-01	RETAINER (S), CASSETTE	
156	X-3695-448-3	ARM ASSY, BLIND	
157	3-669-465-00	WASHER (1.5), STOPPER	
158	3-695-646-01	ARM, LS	
159	3-695-718-01	SPRING, TENSION	
160	X-3712-037-1	LEVER (A) ASSY (2)	
161	3-315-384-31	WASHER, STOPPER	
162	X-3712-025-1	GEAR ASSY, TS	
163	3-699-402-01	SCREW (M1.3X5.5), TAPPING	
164	3-712-165-01	PLATE (2), STOPPER	
165	A-7060-693-A	FP-53 BOARD, COMPLETE	
166	3-695-698-01	GUIDE, LS	
167	3-695-697-01	SPRING, LEAF, LS	
168	X-3695-436-1	TABLE ASSY, REEL, TAKE-UP	
169	X-3712-038-1	TABLE ASSY (2), REEL, SUPPLY	190
170	3-542-475-00	SPRING, TENSION	
171	3-712-151-01	BRAKE (2), SOFT	
172	3-695-735-04	ARM, TG1 RELEASE	
173	X-3695-432-1	BAND ASSY, TG1	
174	X-3712-019-1	ARM ASSY (2), TG1	
175	3-695-591-01	SPRING, TENSION	
176	3-695-733-01	PLATE, CAM, LS	
177	X-3712-022-1	ARM (B) ASSY (2), PINCH	
178	X-3712-032-2	ARM (C) ASSY (2), PINCH	192, 193
179	3-695-622-01	SPRING, TENSION	
180	3-695-719-01	SPRING, TENSION	
181	X-3695-415-1	PINCH LEVER ASSY	
182	3-695-624-01	BASE, PROTECT	
183	X-3712-027-1	ARM ASSY (2), TG7	
184	3-695-541-01	SPRING	
185	3-712-158-01	FLANGE, UPPER, TG7	
186	3-712-160-01	SLEEVE (2), TG7	
187	3-712-159-01	FLANGE, LOWER, TG7	
188	3-712-157-01	SPRING, COMPRESSION	
189	X-3713-962-1	CHASSIS ASSY (2), LS	
190	3-701-444-01	WASHER, 6	
191	3-321-393-01	WASHER, STOPPER	
192	X-3695-416-1	PINCH ROLLER ASSY	
193	3-695-569-01	SLEEVE (P), PINCH INNER	
194	*3-725-151-01	PLATE, GROUND, RP	
195	3-719-695-21	SCREW (M1.7X3.5), SPECIAL HEAD	

5-5. CHASSIS ASSEMBLY (1)



Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.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P1.4×2.5
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P1.4×2.2
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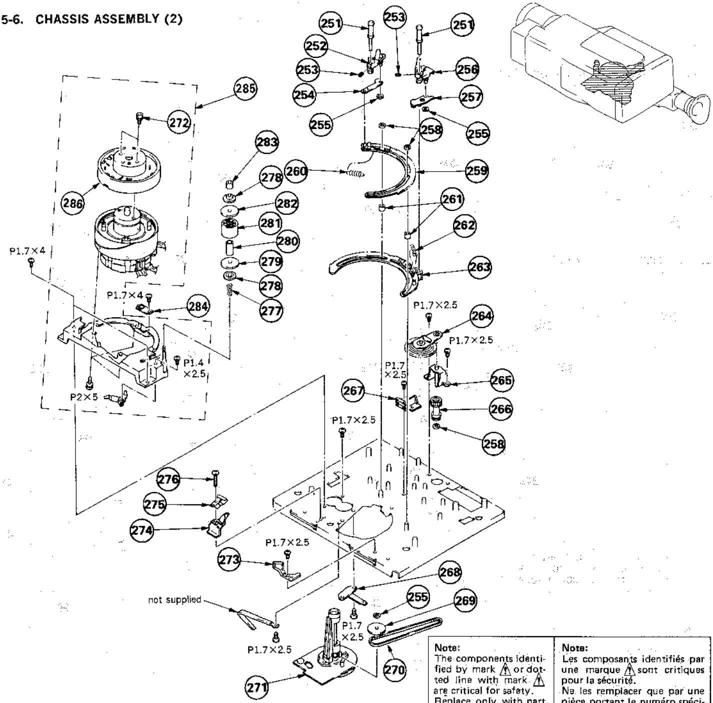
P1.7×2.5

No.	Part No.	Description	Remark
201	3-315-384-31	WASHER, STOPPER	
202	X-3712-023-1	ARM (A) ASSY (2), PINCH	
203	3-695-589-01	LEVER (B), REEL LOCK	
204	3-669-465-00	WASHER (1.5), STOPPER	
205	X-3695-439-4	SLIDER ASSY, M	
206	X-3712-031-1	CAM ASSY (2)	
207	3-712-156-01	GEAR (M) (2), THREADING	
208	3-695-537-01	GEAR (T), THREADING	
209	3-695-536-01	GEAR (S), THREADING	
210	3-695-706-01	SPRING (T)	
211	3-695-559-01	GEAR (B), THREADING	
212	3-695-724-01	GEAR (D), THREADING	
213	3-712-162-02	GEAR (C) (2), THREADING	
214	3-695-714-01	GEAR (A), LS	
215	3-695-563-04	GEAR (B), LS	
216	X-3695-417-1	GEAR (C) ASSY, LS	
217	3-695-705-01	SPRING (S)	
218	3-713-937-01	SPRING (A) (2)	
219	X-3695-418-1	ARM ASSY, LOCK	
220	3-695-574-01	ARM, RETURN PREVENTION	
221	3-695-579-01	SPRING (B), TORSION	
222	X-3712-018-1	BASE ASSY (2), LOCK	
223	1-553-226-00	SWITCH, LEAF (CASSETTE DOWN)	
224	X-3695-438-1	ARM ASSY, EJECT	
225	3-321-393-01	WASHER, STOPPER	
226	3-712-150-01	WHEEL, WORM	
227	X-3712-017-1	HOLDER ASSY, MOTOR	
228	⚠1-541-508-11	MOTOR, DC (LA14-323F) (M903)	
229	X-3712-036-1	CHASSIS ASSY (2), MECHANICAL	
230	1-161-051-00	CERAMIC CAPACITOR 0.01MF (C901)	

5-6. CHASSIS ASSEMBLY (2)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P1.4
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×2.5
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P2×5
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P1.7×2.5
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P1.7×2.5
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255
269
not supplied
P1.7
×2.5
P1.7×2.5
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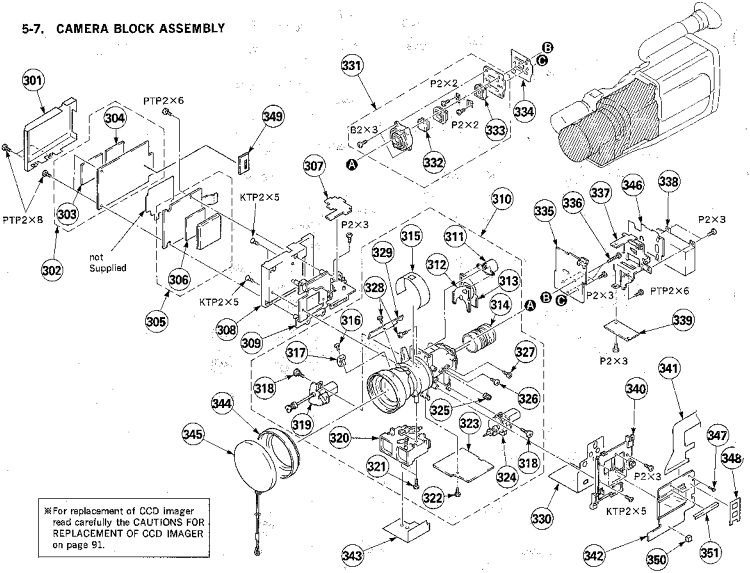
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
251	X-3712-029-1	ROLLER ASSY (2), GUIDE	
252	X-3712-030-1	BASE ASSY (2), TG5	
253	3-695-770-01	SCREW, GR LOCK	
254	3-695-545-01	JOINT, T	
255	3-321-393-01	WASHER, STOPPER	
256	X-3712-028-1	BASE ASSY (2), TG4	
257	X-3695-429-1	JOINT ASSY, S	
258	3-315-384-31	WASHER, STOPPER	
259	X-3695-414-1	SLIDER (T) ASSY, THREADING	
260	3-695-773-01	SPRING, TENSION	
261	3-695-544-01	ROLLER, GUIDE	
262	3-695-772-01	SPRING, TENSION	
263	X-3695-428-1	SLIDER (S) ASSY, THREADING	
264	X-3712-024-1	ARM ASSY (2), GEAR	
265	X-3712-020-1	BASE ASSY (2), MIDWAY PULLEY	
266	X-3712-021-1	PULLEY ASSY (2), MIDWAY	
267	3-712-163-01	SUPPORT (2), SLIDER	
268	1-535-574-11	TERMINAL, SHAFT GROUND	
269	X-3695-413-1	GEAR ASSY, CHANGE	
270	3-695-637-01	BELT, RELAY	
271	8-835-309-01	MOTOR, DC BHF-3301C (CAPSTAN) (M902)	
272	3-686-434-01	SCREW (2X5), BOLT WASHER	
273	3-695-627-01	STOPPER, SLIDER, S	
274	3-695-628-01	STOPPER, SLIDER, T	
275	3-695-677-01	SPRING (T), LEAF	
276	3-695-519-01	SCREW, FITTING, LEAF SPRING(T)	
277	3-695-532-01	SPRING, COMPRESSION	
278	3-695-727-01	RETAINER, FLANGE, UPPER	
279	3-695-794-01	FLANGE, LOWER, TG2	
280	3-695-530-01	SLEEVE, TG2	
281	3-712-164-01	ROLLER (2), TG2	
282	3-695-528-01	FLANGE, TG2	
283	3-695-529-01	NUT, TG2	
284	1-807-238-11	SENSOR, DEW CONDENSATION	
285	⚠.A-7048-150-A	DRUM ASSY (DGU-16D-R)(CCD-F50)	272, 286
	⚠.A-7048-173-A	DRUM ASSY (DGU-20B-R)(CCD-F70)	272, 286
286	A-7049-095-A	DRUM ASSY, UPPER (DGR-16-R) (CCD-F50)	
	A-7949-130-A	DRUM ASSY, UPPER (DGR-20-R) (CCD-F70)	

5-7. CAMERA BLOCK ASSEMBLY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PTP2×8
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PTP2×6
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KTP2×5
KTP2×5
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P2×3
308
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P2×2
B2×3
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P2×2
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P2×3
P2×3
PTP2×6
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P2×3
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P2×3
KTP2×5
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※For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

No.	Part No.	Description	Remark
301	*X-3724-551-1	CASE (B) ASSY, SHIELD, VC	
302	*A-7061-580-A	VC-63 BOARD, COMPLETE (CCD-F70)	303, 304
	*A-7061-720-A	VC-63 BOARD, COMPLETE (CCD-F50)	303, 304
303	A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)	
304	A-7068-129-A	PR-20 BOARD, COMPLETE (HIC)	
305	*A-7061-612-A	VC-62 BOARD, COMPLETE	306
306	A-7068-150-A	DT-73 BOARD, COMPLETE (HIC)	
307	*A-7070-854-A	FD-12 BOARD, COMPLETE (CCD-F70)	
	*A-7070-866-A	FD-12 BOARD, COMPLETE (CCD-F50)	
308	*X-3724-550-1	CASE (A) ASSY, SHIELD, VC	
309	X-3726-501-1	FRAME (A) ASSY, CAMERA	
310	1-547-333-11	LENS, ZOOM (8508XA)	311-329
311	3-707-442-01	METER, IG	
312	3-707-457-01	(B) ASSY, IRIS FEATHER	
313	3-707-458-01	FEATHER, IRIS (A)	
314	3-707-456-01	MIRROR TUBE UNIT, RELAY	
315	3-707-443-01	SHEET, ZOOM	
316	3-707-445-01	SCREW, (N) STOPPER CLAMP	
317	3-707-446-01	STOPPER, (N)	
318	3-707-447-01	SCREW, MOTOR CLAMP	
319	3-707-448-01	MOTOR UNIT, AF	
320	3-707-449-01	BLOCK UNIT, AF	
321	3-707-450-01	SCREW, AF BLOCK CLAMP	
322	3-707-459-01	SCREW, AF PC BOARD CLAMP	
323	3-707-629-01	PC BOARD UNIT, AF	
324	3-707-452-01	MOTOR UNIT, PZ	
325	3-707-453-01	ROLLER, ECCECTRIC	
326	3-707-454-01	SCREW	
327	3-707-455-01	SCREW, RELAY SET	
328	3-707-444-01	SCREW, IG METER CLAMP	
329	3-707-633-01	PC BOARD UNIT, SW	
330	*3-735-440-01	PLATE, SHIELD, AF	
331	A-7090-878-A	CCD ASSY	332, 333
332	A-7090-879-A	FILTER BLOCK, OPTICAL (OFB-02-01)	
※333	A-7090-878-A	IC ICX026AK-2 (CCD IMAGER) (IC600)	
334	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
335	*A-7061-578-A	VC-61 BOARD, COMPLETE	
336	3-335-640-51	SCREW (M2X16)	
337	*3-735-428-01	JOINT	
338	1-464-993-11	CONVERTER, DC-DC	
339	*1-630-456-11	DC-21 BOARD	
340	X-3725-192-1	FRAME (B) ASSY, CAMERA	
341	1-626-233-11	FP-124 FLEXIBLE BOARD	
342	*A-7061-613-A	FC-25 BOARD, COMPLETE (CCD-F70)	
	*A-7061-625-A	FC-25 BOARD, COMPLETE (CCD-F50)	
343	3-726-533-01	COVER, AF	
344	3-728-269-01	HOOD	
345	A-7090-806-A	CAP ASSY, HOOD	
346	*3-735-439-01	PLATE, SHIELD, VC-61	
347	*1-535-622-11	PIN, TERMINAL	
348	*3-735-467-01	SHEET, INSULATING, DDS	
349	*3-735-481-01	SPACER, VC	
350	*3-735-470-01	SPACER, CAMERA	
351	*3-735-468-01	SHEET, INSULATING, LCD	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	A-7060-693-A	FP-53 BOARD, COMPLETE (Ref.No 3,000 Series) **********************	
	3-713-904-01	HOLDER (2), LED	
		DIODE	
D302	8-719-940-81	DIODE GL452S	
D303	8-719-801-55	DIODE TLP-907-0	
D304	8-719-801-55	DIODE TLP-907-0	
		SWITCH	
S301	1-570-869-11	SWITCH, PUSH (2 KEY)	
**			
	*A-7061-188-A	VF-13 BOARD, COMPLETE (Ref.No 5,000 Series) **********************	
	3-713-535-01	CUSHION, CRT	
	*3-725-155-01	INSULATOR, FB	
		CAPACITOR	
C901	1-126-369-11	ELECT 220MF 20% 6.3V	
C902	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C904	1-127-515-11	ELECT(SOLID) 47MF 20% 6.3V	
C905	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C906	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C907 ⚠	1-162-625-11	CERAMIC CHIP 0.0047MF 5% 50V	
C908 ⚠	1-163-015-00	CERAMIC CHIP 0.0033MF 10% 50V	
C909	1-126-193-11	ELECT CHIP 1MF 20% 50V	
C911	1-131-388-00	TANTALUM 68MF 10% 3.15V	
C912	1-102-038-00	CERAMIC 0.001MF 500V	
C913	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C915	1-126-193-11	ELECT CHIP 1MF 20% 50V	
C916	1-163-037-11	CERAMIC CHIP 0.022MF 10% 25V	
C917	1-135-166-21	TANTAL. CHIP 47MF 20% 6.3V	
C918	1-162-638-11	CERAMIC CHIP 1MF 16V	
C919	1-135-070-00	TANTAL. CHIP 0.1MF 10% 35V	
C920	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
		CONNECTOR	
CN901	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P	
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
		CONPOSITION CIRCUIT BLOCK	
CP901	1-238-119-11	RES, ADJ	
		SOCKET	
CRT901	1-526-978-21	SOCKET ASSY, CRT	
		DIODE	
D903	8-719-400-20	DIODE MA152WA	
		IC	
IC901	8-759-420-01	IC AN2512S-T1	
		COIL	
L901	1-408-421-00	INDUCTOR 100UH	
L902	1-410-379-21	INDUCTOR CHIP 6.8UH	
L903 ⚠	1-459-858-11	COIL, FERRITE (HLC)	
		TRANSISTOR	
Q902	8-729-402-31	TRANSISTOR 2SD1819A-Q-TX	
Q903	8-729-106-64	TRANSISTOR 2SD1615	
Q904	8-729-216-32	TRANSISTOR 2SA1163G	
		RESISTOR	
R902	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R903	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R904 ⚠	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R906 ⚠	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R907	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R908	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R909	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R911	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R912	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R913	1-216-123-11	METAL GLAZE 1.2M 5% 1/10W	
R914	1-216-133-00	METAL GLAZE 3.3M 5% 1/10W	
R915	1-216-133-00	METAL GLAZE 3.3M 5% 1/10W	
R916	1-216-125-00	METAL GLAZE 1.5M 5% 1/10W	
R917	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R919	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R920	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R921	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R922	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R923	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R924	1-216-306-11	METAL GLAZE 3.9 5% 1/10W	
R925	1-216-336-11	METAL GLAZE 47K 1% 1/10W	
R926	1-218-163-11	METAL GLAZE 120K 1% 1/10W	
R928	1-216-870-11	METAL GLAZE 180K 1% 1/10W	
R929	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R930	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R931	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
		VARIABLE RESISTOR	
RV901	1-230-203-00	RES, ADJ, METAL GLAZE 2.2M	
		TRANSFORMER	
T901 ⚠	1-439-428-11	TRANSFORMER ASSY, FLYBACK	
		THERMISTOR	
TH901	1-807-938-11	THERMISTOR	
**			

TL-18 TL-19 FV-4 EJ-9 FD-12 SS-93

Ref.No	Part No.	Description	Remark
	*A-7070-645-A	TL-18 BOARD, COMPLETE	(Ref.No 5,000 Series)
		DIODE	
D950	8-719-941-34	DIODE GL1HD51	
		RESISTOR	
R950	1-216-037-00	METAL GLAZE 330 5% 1/10W	

* * *

Ref.No	Part No.	Description	Remark
	*A-7070-646-A	TL-19 BOARD, COMPLETE	(Ref.No 5,000 Series)
		DIODE	
D955	8-719-941-34	DIODE GL1HD51	

* * *

Ref.No	Part No.	Description	Remark
	*A-7070-856-A	FV-4 BOARD, COMPLETE	(CCD-F70)
	*A-7070-867-A	FV-4 BOARD, COMPLETE	(CCD-F50) (Ref.No 4,000 Series)
		CONNECTOR	
CN160	1-566-527-11	CONNECTOR, FPC (ZIF) 11P	
		SWITCH	
S160	1-571-101-12	SWITCH, SLIDE (POWER)	
S161	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (◀▮)	(CCD-F70)
S162	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (◀▮▮)	(CCD-F70)
S163	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (▮▮)	
S164	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (◀)	
S165	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (◀◀)	
S166	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (■)	
S167	1-571-102-21	SWITCH, SLIDE (● REC)	
S168	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (▶▶)	

* * *

Ref.No	Part No.	Description	Remark
	*A-7070-855-A	EJ-9 BOARD, COMPLETE	(Ref.No 4,000 Series)
		SWITCH	
S169	1-571-102-11	SWITCH, SLIDE (EJECT)	

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Ref.No	Part No.	Description	Remark
	*A-7070-854-A	FD-12 BOARD, COMPLETE	(CCD-F70)
	*A-7070-866-A	FD-12 BOARD, COMPLETE	(CCD-F50) (Ref.No 4,000 Series)
		CONNECTOR	
CN150	*1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		RESISTOR	
R150	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F70)
R151	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F50)
R152	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F70)
R153	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F50)
R154	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F70)
R155	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F50)
		SWITCH	
S150	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (EDIT SEARCH +)	
S151	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (EDIT SEARCH -)	
S152	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (RESET)	(CCD-F70)
S153	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (MEMORY)	(CCD-F70)
S153	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (ZERO MEMORY)	(CCD-F50)
S154	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (COLOR/MODE)	(CCD-F70)
S154	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (RESET)	(CCD-F50)
S155	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (ZERO MEMORY)	(CCD-F70)

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Ref.No	Part No.	Description	Remark
	*A-7061-583-A	SS-93 BOARD, COMPLETE	(CCD-F70)
	*A-7061-624-A	SS-93 BOARD, COMPLETE	(CCD-F50) (Ref.No 2,000 Series)
		CAPACITOR	
C001	1-126-204-11	ELECT CHIP 47MF 20% 16V	
C002	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C003	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C004	1-126-198-11	ELECT CHIP 4.7MF 20% 35V	
C006	1-124-779-00	ELECT CHIP 10MF 20% 16V	
C007	1-124-779-00	ELECT CHIP 10MF 20% 16V	
C008	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C009	1-126-206-11	ELECT CHIP 100MF 20% 6.3V	
C010	1-162-638-11	CERAMIC CHIP 1MF 16V	
C011	1-162-638-11	CERAMIC CHIP 1MF 16V	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
C012	1-124-778-00	ELECT CHIP 22MF 20%	6.3V
C014	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C015	1-163-034-00	CERAMIC CHIP 0.033MF	50V
C017	1-163-038-00	CERAMIC CHIP 0.1MF	25V (CCD-F70)
C051	1-163-077-00	CERAMIC CHIP 0.1MF 10%	25V
C052	1-163-077-00	CERAMIC CHIP 0.1MF 10%	25V
C053	1-163-077-00	CERAMIC CHIP 0.1MF 10%	25V
C054	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C055	1-124-577-11	ELECT 82MF 20%	10V
C056	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C057	1-124-577-11	ELECT 82MF 20%	10V
C058	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C059	1-124-577-11	ELECT 82MF 20%	10V
C060	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C061	1-126-204-11	ELECT CHIP 47MF 20%	16V
C062	1-162-638-11	CERAMIC CHIP 1MF	16V
C063	1-135-149-21	TANTAL. CHIP 2.2MF 20%	6.3V
C064	1-135-091-00	TANTAL. CHIP 1MF 20%	16V
C065	1-127-506-00	ELECT(SOLID) 1MF 20%	25V
C066	1-162-638-11	CERAMIC CHIP 1MF	16V
C067	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C068	1-126-196-11	ELECT CHIP 3.3MF 20%	50V
C069	1-124-779-00	ELECT CHIP 10MF 20%	16V
C070	1-135-091-00	TANTAL. CHIP 1MF 20%	16V
C071	1-124-779-00	ELECT CHIP 10MF 20%	16V
C072	1-135-091-00	TANTAL. CHIP 1MF 20%	16V
C073	1-135-091-00	TANTAL. CHIP 1MF 20%	16V
C074	1-124-779-00	ELECT CHIP 10MF 20%	16V
C075	1-124-779-00	ELECT CHIP 10MF 20%	16V
C076	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C084	1-163-033-00	CERAMIC CHIP 0.022MF	50V
C085	1-163-021-00	CERAMIC CHIP 0.01MF	50V
C086	1-136-017-00	CERAMIC CHIP 0.0047MF	50V
C087	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C088	1-163-101-00	CERAMIC CHIP 22PF 5%	50V
C089	1-163-101-00	CERAMIC CHIP 22PF 5%	50V
C200	1-124-779-00	ELECT CHIP 10MF 20%	16V
C201	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C202	1-163-038-00	CERAMIC CHIP 0.1MF	25V (CCD-F70)
C204	1-124-779-00	ELECT CHIP 10MF 20%	16V (CCD-F70)
C205	1-163-035-00	CERAMIC CHIP 0.047MF	50V (CCD-F70)
C206	1-124-779-00	ELECT CHIP 10MF 20%	16V (CCD-F70)
C207	1-163-035-00	CERAMIC CHIP 0.047MF	50V (CCD-F70)
C209	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V (CCD-F70)
C210	1-163-009-11	CERAMIC CHIP 0.001MF 10%	50V (CCD-F70)
C211	1-163-035-00	CERAMIC CHIP 0.047MF	50V (CCD-F70)
C212	1-124-779-00	ELECT CHIP 10MF 20%	16V (CCD-F70)
C213	1-124-778-00	ELECT CHIP 22MF 20%	6.3V (CCD-F70)
C215	1-135-145-11	TANTAL. CHIP 0.47MF 20%	25V (CCD-F70)
C216	1-163-059-00	CERAMIC CHIP 0.01MF 10%	50V (CCD-F70)
C217	1-163-038-00	CERAMIC CHIP 0.1MF	25V (CCD-F70)
C218	1-163-089-00	CERAMIC CHIP 6PF 0.5PF	50V (CCD-F70)
C301	1-163-117-00	CERAMIC CHIP 100PF 5%	50V
C302	1-163-121-00	CERAMIC CHIP 150PF 5%	50V
C303	1-163-115-00	CERAMIC CHIP 82PF 5%	50V
C304	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C305	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C306	1-163-117-00	CERAMIC CHIP 100PF 5%	50V
C308	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C309	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C310	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C311	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C312	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C313	1-163-077-00	CERAMIC CHIP 0.1MF 10%	25V
C314	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C315	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C316	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C317	1-124-778-00	ELECT CHIP 22MF 20%	6.3V
C318	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C319	1-163-137-00	CERAMIC CHIP 680PF 5%	50V
C320	1-124-778-00	ELECT CHIP 22MF 20%	6.3V
C321	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C322	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C323	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C324	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C325	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V
C326	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C327	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C328	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V
C329	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C330	1-124-778-00	ELECT CHIP 22MF 20%	6.3V
C332	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C333	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C334	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C335	1-124-778-00	ELECT CHIP 22MF 20%	6.3V (CCD-F70)
C336	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C337	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C338	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C339	1-124-778-00	ELECT CHIP 22MF 20%	6.3V (CCD-F70)
C340	1-163-109-00	CERAMIC CHIP 47PF 5%	50V (CCD-F70)
C341	1-124-779-00	ELECT CHIP 10MF 20%	16V (CCD-F70)
C342	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V (CCD-F70)
C343	1-124-778-00	ELECT CHIP 22MF 20%	6.3V (CCD-F70)
C344	1-163-809-11	CERAMIC CHIP 0.047MF 10%	25V (CCD-F70)
C345	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C346	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C347	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C348	1-124-778-00	ELECT CHIP 22MF 20%	6.3V
C349	1-163-109-00	CERAMIC CHIP 47PF 5%	50V
C350	1-163-123-00	CERAMIC CHIP 180PF 5%	50V
C351	1-163-021-00	CERAMIC CHIP 0.01MF 10%	50V
C353	1-124-778-00	ELECT CHIP 22MF 20%	6.3V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN001	*1-564-014-31	PIN, CONNECTOR 4P	
CN002	*1-564-014-21	PIN, CONNECTOR 4P	

When indicating parts by reference number, please include the board name.

SS-93

Ref.No	Part No.	Description	Remark
CN003	1-566-529-11	CONNECTOR, FPC (ZIF) 13P	
CN004	*1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
CN005	*1-565-532-11	PIN, CONNECTOR (PC BOARD) 7P	
CN006	*1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
CN007	1-566-536-11	CONNECTOR, FPC (ZIF) 20P	
		TRIMMER	
CT200	1-141-368-11	CAP, CHIP TRIMMER 30P (CCD-F70)	
		DIODE	
D003	8-719-404-46	DIODE MA110	
D004	8-719-940-45	DIODE DWA010	
D050	8-719-938-75	DIODE SB05-05CP	
D051	8-719-938-75	DIODE SB05-05CP	
D200	8-719-100-03	DIODE 1S2835	
D201	8-719-940-45	DIODE DWA010 (CCD-F70)	
D203	8-713-300-88	DIODE 1T33C-01 (CCD-F70)	
D399	8-719-105-32	DIODE RD2.7M-B2	
		IC	
IC001	8-759-144-94	IC UPD78112GF-532-3BE	
IC002	8-759-100-94	IC UPC358G2	
IC003	8-759-804-72	IC LB1631M	
IC004	8-759-202-45	IC CX20114	
IC005	8-759-940-79	IC S-81350AG	
IC006	8-759-107-68	IC CX20115A	
IC007	8-759-805-06	IC CXA1127M	
IC200	8-759-145-69	IC UPD7507HG-552-22	
IC201	8-759-944-88	IC CXK58256MF-15LL	
IC202	8-759-972-39	IC MB670493 (CCD-F70)	
IC203	8-759-101-12	IC UPC311G2 (CCD-F70)	
IC301	8-752-033-38	IC CXA1202R	
		COIL	
L001	1-410-381-11	INDUCTOR CHIP 10UH	
L002	1-410-381-11	INDUCTOR CHIP 10UH	
L050	1-421-983-11	COIL, CHOKE 700UH	
L051	1-421-983-11	COIL, CHOKE 700UH	
L052	1-410-627-11	COIL, CHOKE 100UH	
L052	1-410-627-11	COIL, CHOKE 100UH	
L053	1-410-389-11	INDUCTOR CHIP 47UH	
L200	1-410-377-11	INDUCTOR CHIP 4.7UH	
L201	1-410-377-11	INDUCTOR CHIP 4.7UH (CCD-F70)	
L202	1-410-377-11	INDUCTOR CHIP 4.7UH (CCD-F70)	
L203	1-410-377-11	INDUCTOR CHIP 4.7UH (CCD-F70)	
L204	1-410-384-11	INDUCTOR CHIP 18UH (CCD-F70)	
L301	1-408-777-00	INDUCTOR CHIP 10UH	
L302	1-408-793-21	INDUCTOR CHIP 220UH	
L303	1-412-029-11	INDUCTOR CHIP 10UH	
L304	1-410-385-11	INDUCTOR CHIP 22UH (CCD-F70)	
L305	1-410-732-21	INDUCTOR CHIP 0.18UH (CCD-F70)	
L306	1-410-383-11	INDUCTOR CHIP 15UH (CCD-F70)	
L307	1-412-033-11	INDUCTOR CHIP 220UH	
L308	1-412-033-11	INDUCTOR CHIP 220UH	
		PHOTO TRANSISTOR	
PH001	8-729-905-07	PHOTO TRANSISTOR PT480FS (CCD-F70)	
PH002	8-729-905-07	PHOTO TRANSISTOR PT480FS (CCD-F70)	
		TRANSISTOR	
Q001	8-729-808-18	TRANSISTOR 2SB926-T	
Q002	8-729-117-32	TRANSISTOR 2SC4177	
Q005	8-729-903-10	TRANSISTOR FMW1	
Q006	8-729-903-10	TRANSISTOR FMW1	
Q007	8-729-905-45	TRANSISTOR DTA143EU	
Q008	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q051	8-729-805-25	TRANSISTOR 2SB1121	
Q052	8-729-805-25	TRANSISTOR 2SB1121	
Q053	8-729-904-07	TRANSISTOR FMG2	
Q054	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q055	8-729-402-42	TRANSISTOR UN5213	
Q070	8-729-920-39	TRANSISTOR 1MT1US	
Q071	8-729-904-07	TRANSISTOR FMG2	
Q073	8-729-905-45	TRANSISTOR DTA143EU	
Q074	8-729-402-42	TRANSISTOR UN5213	
Q075	8-729-403-35	TRANSISTOR UN5113	
Q076	8-729-402-42	TRANSISTOR UN5213	
Q078	8-729-403-35	TRANSISTOR UN5113	
Q079	8-729-402-53	TRANSISTOR UN5112	
Q080	8-729-805-25	TRANSISTOR 2SB1121	
Q081	8-729-805-25	TRANSISTOR 2SB1121	
Q090	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q201	8-729-117-16	TRANSISTOR 2SA1611-M6 (CCD-F70)	
Q202	8-729-117-32	TRANSISTOR 2SC4177 (CCD-F70)	
Q203	8-729-402-42	TRANSISTOR UN5213 (CCD-F70)	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q205	8-729-402-42	TRANSISTOR UN5213	
Q206	8-729-402-42	TRANSISTOR UN5213	
Q301	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q302	8-729-173-38	TRANSISTOR 2SA733-K	
Q303	8-729-216-22	TRANSISTOR 2SA1162	
Q304	8-729-403-35	TRANSISTOR UN5113	
Q307	8-729-402-42	TRANSISTOR UN5213	
Q308	8-729-810-25	TRANSISTOR 2SC4397 (CCD-F70)	
Q309	8-729-102-07	TRANSISTOR 2SC2223-F13 (CCD-F70)	
Q310	8-729-102-07	TRANSISTOR 2SC2223-F13 (CCD-F70)	
Q311	8-729-117-32	TRANSISTOR 2SC4177 (CCD-F70)	
Q312	8-729-117-32	TRANSISTOR 2SC4177 (CCD-F70)	
Q313	8-729-117-32	TRANSISTOR 2SC4177 (CCD-F70)	
Q314	8-729-402-42	TRANSISTOR UN5213 (CCD-F70)	
Q315	8-729-905-57	TRANSISTOR DTA124EU (CCD-F70)	
Q316	8-729-403-35	TRANSISTOR UN5113 (CCD-F70)	
Q317	8-729-117-32	TRANSISTOR 2SC4177	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q318	8-729-117-32	TRANSISTOR 2SC4177	
Q319	8-729-403-35	TRANSISTOR UN5113	
Q320	8-729-117-32	TRANSISTOR 2SC4177	
Q321	8-729-402-42	TRANSISTOR UN5213 (CCD-F70)	
		RESISTOR	
R001	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R002	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R003	1-216-186-00	METAL GLAZE 330 5% 1/8W	
R004	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R005	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R006	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R007	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R010	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R011	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R012	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R013	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R014	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R015	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R016	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R017	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R018	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R019	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R020	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R021	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R022	1-216-172-00	METAL GLAZE 82 5% 1/8W	
R024	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F70)
R026	1-216-073-00	METAL GLAZE 10K 5% 1/10W	(CCD-F70)
R027	1-216-073-00	METAL GLAZE 10K 5% 1/10W	(CCD-F70)
R028	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R029	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R030	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R031	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R032	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R033	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R034	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R035	1-216-097-00	METAL GLAZE 100K 5% 1/10W	(CCD-F50)
R036	1-216-097-00	METAL GLAZE 100K 5% 1/10W	(CCD-F50)
R038	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R040	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R041	1-216-089-00	METAL GLAZE 47K 5% 1/10W	(CCD-F70)
R045	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R050	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R051	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R052	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R053	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R054	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R055	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R056	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R057	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R058	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R059	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R060	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R061	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R062	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R063	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R064	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R065	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R066	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R067	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R068	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R069	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R070	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R071	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R072	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R073	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R074	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R075	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R076	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R077	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R078	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R079	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R080	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R081	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R082	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R083	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R084	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R085	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R086	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R087	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R090	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R091	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R092	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R093	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R094	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R095	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R096	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R097	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R100	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R101	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R102	1-216-009-00	METAL GLAZE 22 5% 1/10W	
R103	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R104	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R108	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R109	1-216-136-00	METAL GLAZE 2.7 5% 1/8W	
R110	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R111	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R112	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R114	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R115	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R116	1-216-134-00	METAL GLAZE 2.2 5% 1/8W	
R117	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R200	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R201	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R202	1-216-081-00	METAL GLAZE 22K 5% 1/10W	(CCD-F70)
R203	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(CCD-F70)

When indicating parts by reference number, please include the board name.

SS-93 VA-42

Ref.No	Part No.	Description	Remark
R204	1-216-073-00	METAL GLAZE 10K 5%	1/10W(CCD-F70)
R205	1-216-073-00	METAL GLAZE 10K 5%	1/10W(CCD-F70)
R207	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W(CCD-F70)
R208	1-216-049-00	METAL GLAZE 1K 5%	1/10W(CCD-F70)
R209	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W(CCD-F70)
R210	1-216-295-00	METAL GLAZE 0 5%	1/10W(CCD-F70)
R211	1-216-295-00	METAL GLAZE 0 5%	1/10W(CCD-F70)
R212	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W(CCD-F70)
R213	1-216-043-00	METAL GLAZE 560 5%	1/10W(CCD-F70)
R214	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W(CCD-F70)
R215	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W(CCD-F70)
R216	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W(CCD-F70)
R217	1-216-089-00	METAL GLAZE 47K 5%	1/10W(CCD-F70)
R229	1-216-295-00	METAL GLAZE 0 5%	1/10W(CCD-F70)
R230	1-216-097-00	METAL GLAZE 100K 5%	1/10W(CCD-F70)
R231	1-216-097-00	METAL GLAZE 100K 5%	1/10W(CCD-F70)
R233	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R236	1-216-045-00	METAL GLAZE 680 5%	1/10W
R240	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R242	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R243	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R244	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R301	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R302	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R303	1-216-013-00	METAL GLAZE 33 5%	1/10W
R304	1-216-019-00	METAL GLAZE 56 5%	1/10W
R305	1-216-043-00	METAL GLAZE 560 5%	1/10W
R306	1-216-035-00	METAL GLAZE 270 5%	1/10W
R307	1-216-033-00	METAL GLAZE 220 5%	1/10W
R308	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R309	1-216-085-00	METAL GLAZE 33K 5%	1/10W
R311	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W(CCD-F70)
R311	1-216-295-00	METAL GLAZE 0 5%	1/10W(CCD-F50)
R312	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R313	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R314	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
R315	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R316	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R318	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R319	1-216-041-00	METAL GLAZE 470 5%	1/10W
R320	1-216-101-00	METAL GLAZE 150K 5%	1/10W
R321	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R322	1-216-101-00	METAL GLAZE 150K 5%	1/10W
R323	1-216-095-00	METAL GLAZE 82K 5%	1/10W
R324	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R325	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R326	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R327	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R328	1-216-085-00	METAL GLAZE 33K 5%	1/10W
R329	1-216-077-00	METAL GLAZE 15K 5%	1/10W
R331	1-216-047-00	METAL GLAZE 820 5%	1/10W
R332	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
R334	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R335	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R336	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R337	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R338	1-216-083-00	METAL GLAZE 27K 5%	1/10W
R339	1-216-083-00	METAL GLAZE 27K 5%	1/10W
R340	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R341	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R342	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W(CCD-F70)
R343	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W(CCD-F70)
R344	1-216-029-00	METAL GLAZE 150 5%	1/10W(CCD-F70)
R345	1-216-041-00	METAL GLAZE 470 5%	1/10W(CCD-F70)
R346	1-216-025-00	METAL GLAZE 100 5%	1/10W(CCD-F70)
R347	1-216-049-00	METAL GLAZE 1K 5%	1/10W(CCD-F70)
R348	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W(CCD-F70)
R349	1-216-041-00	METAL GLAZE 470 5%	1/10W(CCD-F70)
R350	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W(CCD-F70)
R351	1-216-049-00	METAL GLAZE 1K 5%	1/10W(CCD-F70)
R352	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W(CCD-F70)
R353	1-216-049-00	METAL GLAZE 1K 5%	1/10W(CCD-F70)
R354	1-216-027-00	METAL GLAZE 120 5%	1/10W(CCD-F70)
R355	1-216-049-00	METAL GLAZE 1K 5%	1/10W(CCD-F70)
R356	1-216-073-00	METAL GLAZE 10K 5%	1/10W(CCD-F70)
R357	1-216-035-00	METAL GLAZE 270 5%	1/10W
R358	1-216-041-00	METAL GLAZE 470 5%	1/10W

VARIABLE RESISTOR

RV001	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV002	1-230-874-11	RES, ADJ, METAL GLAZE 100K
RV200	1-230-867-11	RES, ADJ, METAL GLAZE 1K (CCD-F70)
RV301	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV302	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV306	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K (CCD-F70)

CRYSTAL

X001	1-567-885-11	VIBRATOR, CRYSTAL
X200	1-577-082-41	VIBRATOR, CERAMIC

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*A-7061-582-A VA-42 BOARD, COMPLETE (CCD-F70)
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*A-7061-623-A VA-42 BOARD, COMPLETE (CCD-F50)
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(Ref.No 2,000 Series)

*3-718-223-01	HOLDER, TE
*3-725-136-01	REINFORCEMENT, VA-SS
*3-730-889-01	HOLDER, TOP

CAPACITOR

C251	1-162-638-11	CERAMIC CHIP 1MF		16V
C252	1-162-638-11	CERAMIC CHIP 1MF		16V
C253	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C254	1-163-105-00	CERAMIC CHIP 33PF	5%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C255	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C256	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C257	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C258	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C259	1-162-638-11	CERAMIC CHIP	1MF		16V
C260	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C261	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C262	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C263	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C264	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C266	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C267	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C268	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C269	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C270	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C271	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C272	1-162-638-11	CERAMIC CHIP	1MF		16V
C273	1-163-145-00	CERAMIC CHIP	0.0015MF	10%	50V
C274	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C275	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C276	1-163-145-00	CERAMIC CHIP	0.0015MF	10%	50V
C277	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C278	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C360	1-124-779-00	ELECT CHIP	10MF	20%	16V
C362	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C363	1-162-638-11	CERAMIC CHIP	1MF		16V
C364	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C365	1-126-196-11	ELECT CHIP	3.3MF	20%	50V
C366	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C367	1-126-198-11	ELECT CHIP	4.7MF	20%	35V
C368	1-126-195-11	ELECT CHIP	2.2MF	20%	50V
C369	1-124-779-00	ELECT CHIP	10MF	20%	16V
C370	1-162-638-11	CERAMIC CHIP	1MF		16V
C371	1-124-779-00	ELECT CHIP	10MF	20%	16V
C372	1-162-638-11	CERAMIC CHIP	1MF		16V
C373	1-162-638-11	CERAMIC CHIP	1MF		16V
C374	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C375	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C376	1-126-193-11	ELECT CHIP	1MF	20%	50V
C377	1-162-638-11	CERAMIC CHIP	1MF		16V
C378	1-162-638-11	CERAMIC CHIP	1MF		16V
C379	1-126-193-11	ELECT CHIP	1MF	20%	50V
C380	1-126-193-11	ELECT CHIP	1MF	20%	50V
C381	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C382	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V (CCD-F70)
C383	1-124-779-00	ELECT CHIP	10MF	20%	16V (CCD-F70)
C384	1-124-779-00	ELECT CHIP	10MF	20%	16V (CCD-F70)
C385	1-126-208-11	ELECT CHIP	47MF	20%	4V (CCD-F70)
C386	1-126-208-11	ELECT CHIP	47MF	20%	4V (CCD-F70)
C387	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C388	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C389	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C390	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C391	1-126-191-11	ELECT CHIP	0.47MF	20%	50V
C392	1-124-779-00	ELECT CHIP	10MF	20%	16V
C393	1-126-246-11	ELECT CHIP	220MF	20%	4V
C394	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C395	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C396	1-135-149-21	TANTAL. CHIP	2.2MF	20%	6.3V
C397	1-126-192-11	ELECT CHIP	0.68MF	20%	50V
C398	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C399	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C400	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C401	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C402	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C403	1-124-779-00	ELECT CHIP	10MF	20%	16V
C404	1-162-638-11	CERAMIC CHIP	1MF		16V
C405	1-124-779-00	ELECT CHIP	10MF	20%	16V
C406	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C407	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C408	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C409	1-126-191-11	ELECT CHIP	0.47MF	20%	50V
C410	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C411	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C412	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C413	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C414	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C415	1-126-208-11	ELECT CHIP	47MF	20%	4V
C416	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C417	1-124-779-00	ELECT CHIP	10MF	20%	16V
C419	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C420	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C421	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C422	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C423	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C424	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C425	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C426	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C428	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C429	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C430	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C431	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C433	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C434	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V (CCD-F70)
C434	1-124-778-21	TANTAL. CHIP	22MF	20%	6.3V (CCD-F50)
C435	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C436	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C437	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C438	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C439	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C440	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C441	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C442	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C443	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C444	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C445	1-163-109-00	CERAMIC CHIP	47PF	5%	50V

When indicating parts by reference number, please include the board name.

VA-42

Ref.No	Part No.	Description				Remark
C446	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C447	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C448	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C449	1-164-005-11	CERAMIC CHIP	0.47MF		25V	
C450	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C451	1-163-111-00	CERAMIC CHIP	56PF	5%	50V	
C452	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C453	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V	
C454	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C455	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V	
C456	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V	
C457	1-163-095-00	CERAMIC CHIP	12PF	5%	50V	
C458	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C459	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C460	1-163-115-00	CERAMIC CHIP	82PF	5%	50V	
C462	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C463	1-124-778-00	ELECT CHIP	22MF	20%	6.3V	
C464	1-124-778-00	ELECT CHIP	22MF	20%	6.3V	
C466	1-163-119-00	CERAMIC CHIP	120PF	5%	50V	
C467	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C468	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C469	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	
C470	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C471	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C472	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C473	1-124-778-00	ELECT CHIP	22MF	20%	6.3V	
C474	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C475	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C476	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C477	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V	
C478	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C479	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V	
C480	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C481	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C482	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C483	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C484	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C485	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	
C486	1-124-778-00	ELECT CHIP	22MF	20%	6.3V	
C488	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C489	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C490	1-163-101-00	CERAMIC CHIP	22PF	5%	50V	
C491	1-126-191-11	ELECT CHIP	0.47MF	20%	50V	(CCD-F70)
C491	1-164-005-11	ELECT CHIP	0.47MF		25V	(CCD-F50)
C492	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C493	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C494	1-124-279-11	ELECT	3.3MF	20%	25V	
C495	1-163-021-00	CERAMIC CHIP	0.01MF		50V	
C496	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C497	1-163-101-00	CERAMIC CHIP	22PF	5%	50V	
C498	1-163-123-00	CERAMIC CHIP	180PF	5%	50V	
C501	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C502	1-163-111-00	CERAMIC CHIP	56PF	5%	50V	
C503	1-163-101-00	CERAMIC CHIP	22PF	5%	50V	(CCD-F70)
C505	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C507	1-163-093-00	CERAMIC CHIP	10PF	5%	50V	
C511	1-135-072-21	TANTAL. CHIP	0.22MF	20%	35V	
C512	1-163-034-00	CERAMIC CHIP	0.033MF		50V	
C513	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C514	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V	
C515	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C516	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C517	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C518	1-163-035-00	CERAMIC CHIP	0.047MF	5%	50V	
C519	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C520	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C521	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C522	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C523	1-163-127-00	CERAMIC CHIP	270PF	5%	50V	
C524	1-163-097-00	CERAMIC CHIP	15PF	5%	50V	
C528	1-163-097-00	CERAMIC CHIP	15PF	5%	50V	
C529	1-163-033-00	CERAMIC CHIP	0.022MF		50V	(CCD-F70)
C530	1-162-638-11	CERAMIC CHIP	1MF		16V	(CCD-F70)
C550	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V	
C551	1-136-017-00	CERAMIC CHIP	0.0047MF		50V	
C552	1-136-017-00	CERAMIC CHIP	0.0047MF		50V	
C554	1-126-209-11	ELECT CHIP	100MF	20%	4V	
C555	1-162-638-11	CERAMIC CHIP	1MF		16V	
C556	1-162-638-11	CERAMIC CHIP	1MF		16V	
C557	1-135-162-21	TANTAL. CHIP	33MF	20%	4V	
C558	1-126-207-11	ELECT CHIP	33MF	20%	4V	
C559	1-135-091-00	TANTAL. CHIP	1MF	10%	16V	
C560	1-126-209-11	ELECT CHIP	100MF	20%	4V	
C561	1-126-198-11	ELECT CHIP	4.7MF	20%	35V	
C563	1-126-206-11	ELECT CHIP	100MF	20%	6.3V	
C564	1-124-778-00	ELECT CHIP	22MF	20%	6.3V	
C565	1-126-193-11	ELECT CHIP	1MF	20%	50V	
C567	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C568	1-124-779-00	ELECT CHIP	10MF	20%	16V	
C569	1-126-206-11	ELECT CHIP	100MF	20%	6.3V	
C570	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V	
C571	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C572	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V	
C573	1-163-033-00	CERAMIC CHIP	0.022MF		50V	
C577	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	

CONNECTOR

CN360	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P
CN361	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P

TRIMMER

CV360	1-141-368-11	CAP, CHIP TRIMMER 30P

DIODE

D369	8-719-800-76	DIODE ISS123

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
D370	8-719-800-76	DIODE 1SS123	
D371	8-719-100-05	DIODE 1S2837	
D373	8-719-106-43	DIODE RD9.1M-B1	
		FILTER	
FL360	1-236-146-11	FILTER, BAND PASS	
FL361	1-409-439-11	FILTER, TRAP	
FL362	1-567-727-11	FILTER, CERAMIC	
FL550	1-236-145-11	FILTER, BAND PASS	
		IC	
IC250	8-759-209-53	IC CXA1204Q	
IC360	8-752-031-46	IC CXA1200BQ	
IC361	8-752-323-46	IC CXL1501M	
IC362	8-752-033-40	IC CXA1201Q	
IC364	8-759-710-09	IC NJM2233AM(T1)	
IC365	8-759-710-09	IC NJM2233AM(T1)	
IC366	8-759-100-93	IC UPC393G2	
IC367	8-759-140-26	IC UPD6145G-601	
IC368	8-759-204-51	IC TC40H008F-TP1	
IC369	8-759-200-81	IC TC4053BF	
IC550	8-741-150-50	IC SBX1505-01	
		COIL	
L250	1-408-789-21	INDUCTOR CHIP 100UH	
L251	1-408-795-21	INDUCTOR CHIP 330UH	
L252	1-410-393-11	INDUCTOR CHIP 100UH	
L360	1-412-031-11	INDUCTOR CHIP 47UH	
L361	1-412-031-11	INDUCTOR CHIP 47UH	
L362	1-410-393-11	INDUCTOR CHIP 100UH	
L363	1-412-031-11	INDUCTOR CHIP 47UH	
L364	1-410-392-11	INDUCTOR CHIP 82UH	
L365	1-410-393-11	INDUCTOR CHIP 100UH	
L366	1-410-393-11	INDUCTOR CHIP 100UH	
L367	1-410-389-11	INDUCTOR CHIP 47UH	
L368	1-410-381-11	INDUCTOR CHIP 10UH	
L369	1-410-657-21	INDUCTOR CHIP 180UH	
L371	1-408-795-21	INDUCTOR CHIP 330UH	
L372	1-408-795-21	INDUCTOR CHIP 330UH	
L373	1-408-797-11	INDUCTOR CHIP 470UH	
L375	1-410-393-11	INDUCTOR CHIP 100UH	
L376	1-408-795-21	INDUCTOR CHIP 330UH	
L377	1-410-655-11	INDUCTOR CHIP 120UH	
L378	1-410-393-11	INDUCTOR CHIP 100UH	
L379	1-410-656-11	INDUCTOR CHIP 150UH	
L380	1-410-390-11	INDUCTOR CHIP 56UH	
L381	1-410-385-11	INDUCTOR CHIP 22UH	
L382	1-410-388-21	INDUCTOR CHIP 39UH	
L383	1-410-380-31	INDUCTOR CHIP 8.2UH	
L384	1-410-388-21	INDUCTOR CHIP 39UH	
L385	1-410-392-11	INDUCTOR CHIP 82UH	
L386	1-410-393-11	INDUCTOR CHIP 100UH	
L387	1-410-388-21	INDUCTOR CHIP 39UH	
L388	1-410-390-11	INDUCTOR CHIP 56UH	
L389	1-410-392-11	INDUCTOR CHIP 82UH (CCD-F70)	
L390	1-410-392-11	INDUCTOR CHIP 82UH	
L391	1-410-386-11	INDUCTOR CHIP 27UH	
L392	1-410-393-11	INDUCTOR CHIP 100UH (CCD-F50)	
L550	1-410-389-11	INDUCTOR CHIP 47UH	
		TRANSISTOR	
Q250	8-729-905-23	TRANSISTOR 2SA1576-R	
Q251	8-729-602-21	TRANSISTOR 2SC4154	
Q252	8-729-905-23	TRANSISTOR 2SA1576-R	
Q253	8-729-109-42	TRANSISTOR 2SK94-X2	
Q254	8-729-905-18	TRANSISTOR DTC144EU	
Q255	8-729-905-12	TRANSISTOR DTA144EU	
Q360	8-729-101-07	TRANSISTOR 2SB804-AW	
Q361	8-729-602-21	TRANSISTOR 2SC4154	
Q362	8-729-905-12	TRANSISTOR DTA144EU	
Q363	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q364	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q365	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q366	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q367	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q369	8-729-602-21	TRANSISTOR 2SC4154	
Q370	8-729-101-07	TRANSISTOR 2SB804-AW	
Q371	8-729-602-21	TRANSISTOR 2SC4154	
Q372	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q373	8-729-905-23	TRANSISTOR 2SA1576-R	
Q374	8-729-905-23	TRANSISTOR 2SA1576-R	
Q375	8-729-602-21	TRANSISTOR 2SC4154	
Q376	8-729-905-23	TRANSISTOR 2SA1576-R	
Q377	8-729-905-18	TRANSISTOR DTC144EU	
Q378	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q379	8-729-602-21	TRANSISTOR 2SC4154	
Q380	8-729-905-12	TRANSISTOR DTA144EU	
Q381	8-729-905-12	TRANSISTOR DTA144EU	
Q382	8-729-602-21	TRANSISTOR 2SC4154	
Q383	8-729-100-66	TRANSISTOR 2SC1623	
Q384	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q385	8-729-122-63	TRANSISTOR 2SA1226	
Q386	8-729-402-13	TRANSISTOR XN1216 (CCD-F70)	
Q387	8-729-905-23	TRANSISTOR 2SA1576-R	
Q388	8-729-905-23	TRANSISTOR 2SA1576-R	
Q389	8-729-602-21	TRANSISTOR 2SC4154	
Q390	8-729-602-21	TRANSISTOR 2SC4154	
Q392	8-729-905-18	TRANSISTOR DTC144EU	
Q393	8-729-602-21	TRANSISTOR 2SC4154	
Q394	8-729-602-21	TRANSISTOR 2SC4154	
Q395	8-729-602-21	TRANSISTOR 2SC4154	
Q396	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q397	8-729-905-23	TRANSISTOR 2SA1576-R	
Q398	8-729-602-21	TRANSISTOR 2SC4154	
Q399	8-729-905-23	TRANSISTOR 2SA1576-R	
Q400	8-729-905-18	TRANSISTOR DTC144EU	

When indicating parts by reference number, please include the board name.

VA-42

Ref.No	Part No.	Description	Remark
Q401	8-729-905-23	TRANSISTOR 2SA1576	
Q402	8-729-602-21	TRANSISTOR 2SC4154	
Q403	8-729-905-18	TRANSISTOR DTC144EU	
Q404	8-729-905-18	TRANSISTOR DTC144EU	
Q405	8-729-602-21	TRANSISTOR 2SC4154	
Q406	8-729-120-12	TRANSISTOR 2SC1623	
Q407	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q408	8-729-905-12	TRANSISTOR DTA144EU	
Q410	8-729-602-21	TRANSISTOR 2SC4154	
Q411	8-729-602-21	TRANSISTOR 2SC4154	
Q412	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q413	8-729-905-XX	TRANSISTOR DTC114TU	
Q414	8-729-905-18	TRANSISTOR DTC144EU	
Q415	8-729-905-18	TRANSISTOR DTC144EU	
Q416	8-729-905-18	TRANSISTOR DTC144EU	
Q417	8-729-905-23	TRANSISTOR 2SA1576-R	
Q419	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q420	8-729-907-00	TRANSISTOR DTC114EU	
Q421	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q423	8-729-905-18	TRANSISTOR DTC144EU	
Q424	8-729-904-41	TRANSISTOR FMY3 (CCD-F70)	
Q425	8-729-402-13	TRANSISTOR XN1216 (CCD-F70)	
Q426	8-729-602-21	TRANSISTOR 2SC4154 (CCD-F70)	
Q550	8-729-602-21	TRANSISTOR 2SC4154	
Q551	8-729-905-12	TRANSISTOR DTA144EU	
Q552	8-729-602-21	TRANSISTOR 2SC4154	
Q553	8-729-602-21	TRANSISTOR 2SC4154	
Q554	8-729-905-23	TRANSISTOR 2SA1576-R	
Q555	8-729-602-21	TRANSISTOR 2SC4154	
Q556	8-729-907-39	TRANSISTOR IMD2	
Q557	8-729-402-81	TRANSISTOR XN4501	
Q558	8-729-905-12	TRANSISTOR DTA144EU	
Q559	8-729-905-18	TRANSISTOR DTC144EU	
		RESISTOR	
R250	1-216-296-00	METAL GLAZE 0 5% 1/8W	
R251	1-216-073-91	METAL GLAZE 10K 5% 1/10W	(CCD-F50)
R251	1-216-081-00	METAL GLAZE 22K 5% 1/10W	(CCD-F70)
R252	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R253	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R254	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R255	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R256	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R257	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R258	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R259	1-216-117-00	METAL GLAZE 680K 5% 1/10W	
R260	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R261	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R262	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R263	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R264	1-216-031-00	METAL GLAZE 180 5% 1/10W	
R265	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R266	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R267	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R268	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R269	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R270	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R271	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R272	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R273	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R274	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R275	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R276	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R280	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F50)
R281	1-216-103-00	METAL GLAZE 180K 5% 1/10W	
R282	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R283	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R284	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R285	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R286	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R287	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R288	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R289	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R290	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R291	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R292	1-216-295-00	METAL GLAZE 0 5% 1/10W	(CCD-F50)
R293	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R294	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	(CCD-F70)
R295	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R360	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R361	1-216-027-00	METAL GLAZE 120 5% 1/10W	
R362	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R363	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R364	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R365	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R366	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R367	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R368	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R369	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R370	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R371	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	(CCD-F70)
R372	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	(CCD-F70)
R373	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(CCD-F70)
R374	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(CCD-F70)
R375	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	(CCD-F70)
R376	1-216-085-00	METAL GLAZE 33K 5% 1/10W	(CCD-F70)
R377	1-216-049-00	METAL GLAZE 1K 5% 1/10W	(CCD-F70)
R378	1-216-081-00	METAL GLAZE 22K 5% 1/10W	(CCD-F70)
R379	1-216-049-00	METAL GLAZE 1K 5% 1/10W	(CCD-F70)
R380	1-216-049-00	METAL GLAZE 1K 5% 1/10W	(CCD-F70)
R381	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R382	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R383	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R384	1-216-075-00	METAL GLAZE 12K 5% 1/10W	(CCD-F70)
R385	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R386	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	(CCD-F70)

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R387	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R388	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R389	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R390	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W(CCD-F70)	
R391	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R392	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R393	1-216-083-00	METAL GLAZE	27K	5%	1/10W(CCD-F70)	
R394	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R395	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R396	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R397	1-216-304-11	METAL GLAZE	3.3	5%	1/10W	
R398	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R399	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R400	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R401	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R402	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R403	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R404	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R405	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R406	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R407	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R408	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R409	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R410	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R411	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R412	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R413	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R414	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R415	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R417	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R418	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R419	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R420	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R421	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R422	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R423	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R424	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R425	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R426	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R427	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R428	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R429	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R431	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R432	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R434	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R435	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R436	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R437	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R439	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R440	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R441	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R442	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R444	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R445	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R446	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R447	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R448	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R449	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R450	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R451	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R452	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R453	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R454	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R456	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R457	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R458	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R459	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R460	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R462	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R463	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R464	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R465	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R466	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R467	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R468	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R469	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R470	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R471	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R472	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R473	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R474	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R475	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R476	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R477	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R478	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R479	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R480	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R481	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R482	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R483	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R484	1-216-029-00	METAL GLAZE	150	5%	1/10W	
R485	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R486	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R487	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R488	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R489	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R490	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R491	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R492	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R493	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R494	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R495	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R496	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R497	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R498	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R499	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	

When indicating parts by reference number, please include the board name.

VA-42

Ref.No	Part No.	Description				Remark
R500	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R501	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R502	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R503	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R504	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R505	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R506	1-216-117-00	METAL GLAZE	680K	5%	1/10W	
R508	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R509	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R510	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R511	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R512	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R513	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R514	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R515	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R516	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R517	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	(CCD-F70)
R518	1-216-083-00	METAL GLAZE	27K	5%	1/10W	(CCD-F70)
R519	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R520	1-216-095-00	METAL GLAZE	82K	5%	1/10W	(CCD-F70)
R521	1-216-295-00	METAL GLAZE	0	5%	1/10W	(CCD-F50)
R522	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R523	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R525	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R526	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R527	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R528	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R529	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R530	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R531	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R532	1-216-041-00	METAL GLAZE	470	5%	1/10W	(CCD-F50)
R533	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R536	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R537	1-216-295-00	METAL GLAZE	0	5%	1/10W	(CCD-F50)
R539	1-216-295-00	METAL GLAZE	0	5%	1/10W	(CCD-F50)
R540	1-216-047-00	METAL GLAZE	820	5%	1/10W	(CCD-F70)
R541	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R542	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R544	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R545	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R546	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R547	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R548	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R549	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R550	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R551	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R553	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R554	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R555	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R556	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R557	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R558	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R559	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R560	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R561	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R562	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R563	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R564	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R565	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R566	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R567	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R568	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R569	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R570	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R571	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R572	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R573	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R574	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R575	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R576	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R577	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R578	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R579	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R580	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R581	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R582	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R583	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R584	1-216-073-00	METAL GLAZE	10K	5%	1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV360	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV361	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV362	1-230-866-11	RES, ADJ, METAL GLAZE 470	
RV363	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV364	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV365	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV366	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV367	1-230-867-11	RES, ADJ, METAL GLAZE 1K	(CCD-F70)
RV368	1-230-866-11	RES, ADJ, METAL GLAZE 470	
RV369	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	

TERMINAL PIN

Ref.No	Part No.	Description
TP361	*1-535-622-11	PIN, TERMINAL
TP362	*1-535-622-11	PIN, TERMINAL

CRYSTAL

Ref.No	Part No.	Description
X250	1-567-700-21	VIBRATOR, CRYSTAL
X360	1-577-080-11	VIBRATOR, CRYSTAL

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	*A-7061-585-A	MC-36 BOARD, COMPLETE (CCD-F70)	
		*********************************	
	*A-7061-626-A	MC-36 BOARD, COMPLETE (CCD-F50)	
		*********************************	
		(Ref.No 2,000 Series)	
		CAPACITOR	
C550	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C551	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C553	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	(CCD-F70)
C553	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	(CCD-F50)
C554	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	(CCD-F70)
C555	1-124-225-00	ELECT 100MF 20% 6.3V	
C556	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C557	1-163-137-00	CERAMIC CHIP 680PF 5% 50V	
C559	1-162-638-11	CERAMIC CHIP 1MF 16V	
C560	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C561	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C562	1-124-225-00	ELECT 100MF 20% 6.3V	
C563	1-162-638-11	CERAMIC CHIP 1MF 16V	
C564	1-162-638-11	CERAMIC CHIP 1MF 16V	
C565	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C566	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C567	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	(CCD-F50)
		CONNECTOR	
CN550	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	
CN551	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	
		DIODE	
D551	8-719-106-43	DIODE RD9.1M-B1	
		IC	
IC550	8-759-820-51	IC LA7293M	
		JACK	
J550	1-507-921-00	JACK (EXT MIC)	
J551	1-563-454-11	JACK, MINIATURE (EXT MIC DC OUT)	
		TRANSISTOR	
Q550	8-729-109-43	TRANSISTOR 2SK94-X3	(CCD-F70)
Q551	8-729-602-21	TRANSISTOR 2SC4154	
		RESISTOR	
R550	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R551	1-216-121-00	METAL GLAZE 1M 5% 1/10W	(CCD-F70)
R552	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R553	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R554	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R555	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R556	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	

Ref.No	Part No.	Description	Remark
R557	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W
R558	1-216-295-00	METAL GLAZE 0 5%	1/10W
R559	1-216-043-00	METAL GLAZE 560 5%	1/10W(CCD-F50)
		SWITCH	
S550	1-553-977-00	SWITCH, SLIDE (CCD-F70)	
S551	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	(REC START/STOP)
		**	
	*A-7061-578-A	VC-61 BOARD, COMPLETE	(Ref.No 1,000 Series)
		**********************	
	*3-735-421-01	HOLDER, WB SENSOR	
		CAPACITOR	
C600	1-135-092-21	TANTAL. CHIP 3.3MF 20% 16V	
C601	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C602	1-135-092-21	TANTAL. CHIP 3.3MF 20% 16V	
C603	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C604	1-135-079-21	TANTAL. CHIP 3.3MF 20% 25V	
C605	1-126-196-11	ELECT CHIP 3.3MF 20% 50V	
C606	1-126-400-11	ELECT CHIP 22MF 20% 35V	
C607	1-163-036-00	CERAMIC CHIP 0.068MF 50V	
C608	1-163-036-00	CERAMIC CHIP 0.068MF 50V	
C609	1-164-005-11	CERAMIC CHIP 0.47MF 25V	
C610	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C611	1-162-638-11	CERAMIC CHIP 1MF 16V	
C612	1-163-016-00	CERAMIC CHIP 0.0039MF 5% 50V	
C850	1-130-467-00	MYLAR 470PF 5% 50V	
C851	1-130-481-00	MYLAR 0.0068MF 5% 50V	
C852	1-135-155-21	TANTAL. CHIP 4.7MF 20% 10V	
C853	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C854	1-124-779-00	ELECT CHIP 10MF 20% 16V	
C855	1-162-638-11	CERAMIC CHIP 1MF 16V	
C856	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C857	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C858	1-124-779-00	ELECT CHIP 10MF 20% 16V	
		CONNECTOR	
CN600	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P	
CN601	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	
CN850	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
		DIODE	
D600	8-719-404-32	DIODE MA141WA	
D601	8-719-404-46	DIODE MA110	
D850	8-719-104-34	DIODE 1S2836	
		IC	
※IC600	A-7090-878-A	IC ICX026AK-2 (CCD IMAGER)	
IC850	8-759-030-27	IC MC34182MR	
IC851	8-759-106-23	IC UPD4066BG	
IC852	8-759-012-75	IC MC146805F2FPSC82533F	

※For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
IC853	8-759-100-93	IC UPC393G2	
		COIL	
L600	1-412-032-11	INDUCTOR CHIP 100UH	
L850	1-412-031-11	INDUCTOR CHIP 47UH	
		TRANSISTOR	
Q600	8-729-105-53	TRANSISTOR 2SK300	
Q601	8-729-402-13	TRANSISTOR XN1216	
Q602	8-729-905-35	TRANSISTOR 2SC4081-R	
Q850	8-729-403-06	TRANSISTOR XN1113	
Q851	8-729-403-06	TRANSISTOR XN1113	
Q852	8-729-805-69	TRANSISTOR 2SA1341	
Q855	8-729-403-07	TRANSISTOR XN1213	
Q856	8-729-403-07	TRANSISTOR XN1213	
Q868	8-729-805-45	TRANSISTOR 2SC3395	
Q869	8-729-403-07	TRANSISTOR XN1213	
		RESISTOR	
R600	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R601	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R602	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R603	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R604	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R605	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R606	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R607	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R608	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R609	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R610	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R611	1-216-042-00	METAL GLAZE 510 5% 1/10W	
R613	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R850	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R851	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R852	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R853	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R855	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R856	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R857	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R858	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R860	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R861	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R862	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R863	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R864	1-216-115-00	METAL GLAZE 560K 5% 1/10W	
R865	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R866	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R867	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R868	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R869	1-216-115-00	METAL GLAZE 560K 5% 1/10W	
R870	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R871	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R872	1-216-093-00	METAL GLAZE 68K 5% 1/10W	

Ref.No	Part No.	Description	Remark
R873	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R882	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R883	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R884	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R885	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
		VARIABLE RESISTOR	
RV600	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV850	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
		BALANCE SENSOR	
SB850	1-807-684-11	SENSOR, WHITE BALANCE	
		CRYSTAL	
X850	1-577-082-11	VIBRATOR, CERAMIC	

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*A-7061-612-A VC-62 BOARD, COMPLETE (Ref.No 1,000 Series)
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A-7068-150-A DT-73 BOARD, COMPLETE (HIC)

CAPACITOR

C620	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C621	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C623	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C624	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C625	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C629	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C630	1-126-204-11	ELECT CHIP 47MF	20%	16V
C631	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C632	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C633	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C634	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C635	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C636	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C637	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C638	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C639	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C641	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C643	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C644	1-124-779-00	ELECT CHIP 10MF	20%	16V
C645	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C646	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C647	1-163-036-00	CERAMIC CHIP 0.068MF		50V
C648	1-126-400-11	ELECT CHIP 22MF	20%	35V
C649	1-163-036-00	CERAMIC CHIP 0.068MF		50V
C652	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C653	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C654	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C655	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C656	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C658	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
C660	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C661	1-135-161-21	TANTAL. CHIP 22MF 20% 10V	
C669	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C670	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C673	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C675	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C676	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C677	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C678	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C679	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C680	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C681	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C682	1-163-133-00	CERAMIC CHIP 470PF 10% 50V	
C687	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C688	1-163-023-00	CERAMIC CHIP 0.015MF 10% 50V	
		CONNECTOR	
CN620	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
CN622	*1-506-743-11	PIN, CONNECTOR 5P	
CN623	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	
		DIODE	
D623	8-719-100-05	DIODE 1S2837	
D624	8-719-100-05	DIODE 1S2837	
D626	8-719-100-05	DIODE 1S2837	
		IC	
IC620	8-759-701-24	IC NJM3414M	
IC621	8-752-326-08	IC CXD1159Q	
		COIL	
L622	1-412-029-11	INDUCTOR CHIP 10UH	
L623	1-412-029-11	INDUCTOR CHIP 10UH	
L624	1-412-034-21	INDUCTOR CHIP 330UH	
L625	1-412-032-11	INDUCTOR CHIP 100UH	
L626	1-410-204-31	INDUCTOR CHIP 10UH	
L628	1-410-192-51	INDUCTOR CHIP 1UH	
L629	1-412-026-11	INDUCTOR CHIP 1UH	
L630	1-410-180-51	INDUCTOR CHIP 0.1UH	
L631	1-410-180-51	INDUCTOR CHIP 0.1UH	
		TRANSISTOR	
Q620	8-729-905-35	TRANSISTOR 2SC4081-R	
Q621	8-729-905-23	TRANSISTOR 2SA1576-R	
Q622	8-729-905-35	TRANSISTOR 2SC4081-R	
Q623	8-729-905-23	TRANSISTOR 2SA1576-R	
Q624	8-729-905-23	TRANSISTOR 2SA1576-R	
Q625	8-729-905-35	TRANSISTOR 2SC4081-R	
Q626	8-729-403-07	TRANSISTOR XN1213	
Q627	8-729-905-35	TRANSISTOR 2SC4081-R	
Q628	8-729-905-23	TRANSISTOR 2SA1576-R	
Q629	8-729-809-88	TRANSISTOR 2SA1416-S	

Ref.No	Part No.	Description	Remark
Q630	8-729-810-01	TRANSISTOR 2SC3646-S	
Q631	8-729-905-35	TRANSISTOR 2SC4081-R	
Q632	8-729-905-23	TRANSISTOR 2SA1576-R	
Q633	8-729-905-23	TRANSISTOR 2SA1576-R	
		RESISTOR	
R622	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R624	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R625	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R626	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R627	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R633	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R634	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R635	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R636	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R637	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R638	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R640	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R641	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R642	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R643	1-216-084-00	METAL GLAZE 30K 5% 1/10W	
R644	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R645	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R647	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R648	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R649	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R650	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R651	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R652	1-216-103-00	METAL GLAZE 180K 5% 1/10W	
R653	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R654	1-216-103-00	METAL GLAZE 180K 5% 1/10W	
R655	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R656	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R657	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R659	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R660	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R661	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R667	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R668	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R669	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R670	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R671	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R674	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R675	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R678	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R679	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R682	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R696	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R697	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R698	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R699	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	

When indicating parts by reference number, please include the board name.

VC-62 VC-63

Ref.No	Part No.	Description	Remark
		VARIABLE RESISTOR	
RV620	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV621	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV622	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
		CONNECTOR	
W620	1-574-082-11	CABLE, FLAT (1.0MM PITCH) 15P	
		CRYSTAL	
X620	1-567-898-11	OSCILLATOR, CRYSTAL	

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*A-7061-580-A VC-63 BOARD, COMPLETE (CCD-F70)
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*A-7061-720-A VC-63 BOARD, COMPLETE (CCD-F50)
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(Ref.No 1,000 Series)

A-7068-128-A MX-7 BOARD, COMPLETE (HIC)

A-7068-129-A PR-20 BOARD, COMPLETE (HIC)

Ref.No	Part No.	Description	Remark
		CAPACITOR	
C701	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C702	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C703	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C704	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C705	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C706	1-126-206-11	ELECT CHIP 100MF 20% 6.3V	
C707	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C708	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C709	1-163-111-00	CERAMIC CHIP 56PF 5% 50V	
C712	1-162-638-11	CERAMIC CHIP 1MF 16V	
C715	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C716	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C718	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C719	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C720	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C721	1-163-093-00	CERAMIC CHIP 10PF 5% 50V	
C722	1-164-005-11	CERAMIC CHIP 0.47MF 25V	
C723	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C724	1-164-005-11	CERAMIC CHIP 0.47MF 25V	
C725	1-163-093-00	CERAMIC CHIP 10PF 5% 50V	
C727	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C729	1-126-198-11	ELECT CHIP 4.7MF 20% 35V	
C730	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C731	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C732	1-124-566-11	ELECT 120MF 20% 6.3V	
C733	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C734	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C736	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C737	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	(CCD-F70)
C738	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	(CCD-F70)
C739	1-163-095-00	CERAMIC CHIP 12PF 5% 50V	(CCD-F70)
C740	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C741	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C742	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C743	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C744	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C745	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C746	1-163-097-00	CERAMIC CHIP 15PF 5% 50V	
C747	1-163-095-00	CERAMIC CHIP 12PF 5% 50V	
C748	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C749	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C750	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C753	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C754	1-163-145-00	CERAMIC CHIP 0.0015MF 10% 50V	
C755	1-163-145-00	CERAMIC CHIP 0.0015MF 10% 50V	
C756	1-163-145-00	CERAMIC CHIP 0.0015MF 10% 50V	
C757	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
		CONNECTOR	
CN702	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P	
CN703	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P	
CN704	1-565-879-11	PIN, CONNECTOR (PC BOARD) 7P	
CN705	1-565-880-11	PIN, CONNECTOR (PC BOARD) 8P	
		FILTER	
FL701	1-236-189-11	FILTER, LOW PASS	
FL702	1-236-374-11	LPF, YDL	
FL703	1-236-375-11	LPF, YDL	
FL704	1-236-192-11	FILTER, LOW PASS	
FL706	1-415-669-21	DL (LC)	
FL707	1-236-206-11	FILTER, BAND PASS	
		IC	
IC701	8-752-033-34	IC CXA1072R	
		COIL	
L701	1-412-031-11	INDUCTOR CHIP 47UH	
L702	1-412-031-11	INDUCTOR CHIP 47UH	
L703	1-410-204-31	INDUCTOR CHIP 10UH	
L704	1-410-657-21	INDUCTOR CHIP 180UH	
		TRANSISTOR	
Q701	8-729-905-23	TRANSISTOR 2SA1576-R	
Q702	8-729-905-35	TRANSISTOR 2SC4081-R	
Q705	8-729-905-23	TRANSISTOR 2SA1576-R	
Q706	8-729-905-35	TRANSISTOR 2SC4081-R	(CCD-F70)
Q707	8-729-905-23	TRANSISTOR 2SA1576-R	(CCD-F70)
Q708	8-729-905-35	TRANSISTOR 2SC4081-R	
Q709	8-729-402-78	TRANSISTOR XN6401	
Q710	8-729-905-23	TRANSISTOR 2SA1576-R	
Q711	8-729-905-35	TRANSISTOR 2SC4081-R	
Q712	8-729-905-35	TRANSISTOR 2SC4081-R	

When indicating parts by reference number, please include the board name.

RESISTOR

Ref.No	Part No.	Description				Remark
R701	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R702	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R703	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R704	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R705	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R706	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R707	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R708	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R709	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R710	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R711	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R712	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R713	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R714	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R715	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R716	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R717	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R718	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R719	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R720	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R721	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R722	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R723	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R724	1-216-099-00	METAL GLAZE	120K	5%	1/10W	
R725	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R727	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R728	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R729	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R730	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R731	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R732	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R733	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R734	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R736	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R737	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R738	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R739	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R740	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R741	1-216-080-00	METAL GLAZE	20K	5%	1/10W	
R742	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R743	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R745	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R746	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R747	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R748	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R749	1-216-077-00	METAL GLAZE	15K	5%	1/10W	(CCD-F70)
R750	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	(CCD-F70)
R751	1-216-748-11	METAL GLAZE	39K	5%	1/10W	(CCD-F70)
R752	1-216-085-00	METAL GLAZE	33K	5%	1/10W	(CCD-F70)
R753	1-216-748-11	METAL GLAZE	39K	5%	1/10W	(CCD-F70)
R754	1-216-082-00	METAL GLAZE	24K	5%	1/10W	(CCD-F70)
R755	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R756	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R757	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R758	1-216-049-00	METAL GLAZE	1K	5%	1/10W	(CCD-F70)
R759	1-216-049-00	METAL GLAZE	1K	5%	1/10W	(CCD-F70)
R760	1-216-049-00	METAL GLAZE	1K	5%	1/10W	(CCD-F70)
R761	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	(CCD-F70)
R764	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	(CCD-F70)
R765	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R766	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R767	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R768	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R769	1-216-076-00	METAL GLAZE	13K	5%	1/10W	
R770	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R771	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R772	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R774	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R776	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R777	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R778	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R779	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R780	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R781	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R782	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R783	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R784	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R786	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R787	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R788	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R789	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R790	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R791	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R792	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R793	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R794	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R795	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R796	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R797	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R798	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R799	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R801	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R802	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R805	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R806	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R809	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R810	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R812	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R814	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R816	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R819	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R820	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R821	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R822	1-216-033-00	METAL GLAZE	220	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R823	1-216-115-00	METAL GLAZE 560K 5% 1/10W	
R824	1-216-121-00	METAL GLAZE 1M 5% 1/10W	

VARIABLE RESISTOR

RV701	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV705	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV706	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV707	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV708	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV709	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV710	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV711	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV712	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV713	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV714	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV715	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV716	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV717	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV718	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV719	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV720	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV722	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV724	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV725	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV726	1-230-870-11	RES, ADJ, METAL GLAZE 10K	

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*A-7061-613-A FC-25 BOARD, COMPLETE (CCD-F70)
****

*A-7061-625-A FC-25 BOARD, COMPLETE (CCD-F50)
****

(Ref.No 4,000 Series)

CAPACITOR

C101	1-163-097-00	CERAMIC CHIP 15PF 5% 50V	
C102	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C103	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C104	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C105	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C106	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C107	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C108	1-162-638-11	CERAMIC CHIP 1MF 16V	
C109	1-162-638-11	CERAMIC CHIP 1MF 16V	
C110	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C111	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C112	1-126-151-11	ELECT 4.7MF 20% 16V	
C113	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C114	1-163-021-00	CERAMIC CHIP 0.01MF 50V	

CONNECTOR

CN101	*1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P	
CN102	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	

Ref.No	Part No.	Description	Remark

TRIMMER

CT101	1-141-331-11	CAP, VAR, TRIMMER (CHIP)	

DIODE

D101	8-719-940-45	DIODE DWA010	

IC

IC101	8-759-145-70	IC UPD75308GF-285-3B9	
IC102	8-759-946-03	IC S-8054ALR-LN-S	

COIL

L101	1-410-192-51	INDUCTOR CHIP 1UH	

DISPLAY PANEL

ND101	1-808-704-11	DISPLAY PANEL, LIQUID CRYSTAL	

TRANSISTOR

Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-109-42	TRANSISTOR 2SK94-X2	
Q103	8-729-902-96	TRANSISTOR FMS1	
Q104	8-729-905-15	TRANSISTOR DTC144WU	
Q105	8-729-905-12	TRANSISTOR DTA144EU	
Q106	8-729-905-35	TRANSISTOR 2SC4081-R	
Q107	8-729-920-39	TRANSISTOR IMT1US	
Q108	8-729-905-23	TRANSISTOR 2SA1576-R	
Q109	8-729-905-35	TRANSISTOR 2SC4081-R	
Q110	8-729-109-42	TRANSISTOR 2SK94-X2	

RESISTOR

R109	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R110	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R111	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R112	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R113	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R114	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R115	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R116	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R117	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R118	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R119	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R120	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R121	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R122	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R123	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R124	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R125	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R126	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R127	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R128	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R129	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R130	1-216-073-00	METAL GLAZE 10K 5% 1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R131	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R132	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R133	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R134	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R135	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R136	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R139	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R140	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R141	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R142	1-216-129-00	METAL GLAZE 2.2M 5% 1/10W	
R143	1-216-115-00	METAL GLAZE 560K 5% 1/10W	
R144	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R145	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R146	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R147	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R148	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R149	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R150	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R151	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R152	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R153	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R154	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R155	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R156	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R157	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R158	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R159	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R162	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R163	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R164	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R165	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R166	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R167	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R168	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R169	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R170	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R171	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R172	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R175	1-216-097-00	METAL GLAZE 100K 5% 1/10W	

SWITCH

Ref.No	Part No.	Description	Remark
S101	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE 1) (CCD-F70)	
S102	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE 2) (CCD-F70)	
S103	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE 3) (CCD-F70)	
S104	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE 4) (CCD-F70)	
S105	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (WHITE BALANCE)	
S106	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (FOCUS)	
S107	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (PUSH AUTO)	
S108	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (AHATTER SPEED)	
S109	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)(BACK LIGHT)	
S110	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (FADER)	
S111	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (DATE (+))	
S112	1-570-909-21	SWITCH, TACTIL(REFLOW TYPE)(TIME (NEXT))	
S114	1-570-870-21	SWITCH, SLIDE (AUTO LOCK)	

CRYSTAL

Ref.No	Part No.	Description	Remark
X101	1-577-291-21	VIBRATOR, CERAMIC (WITH (C))	
X102	1-527-997-21	VIBRATOR, CRYSTAL (32.768KHz)	

****

1-626-231-11 FP-118 FLEXIBLE BOARD

****

Ref.No	Part No.	Description	Remark
	1-562-879-11	CONNECTOR, CARD EDGE 19P	
	1-562-880-11	CONNECTOR, CARD EDGE 15P	

****

*1-630-456-11 DC-21 BOARD (Ref.No 1,000 Series)

****

CAPACITOR

Ref.No	Part No.	Description	Remark
C500	1-124-472-11	ELECT 470MF 20% 10V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN500	*1-564-014-31	PIN, CONNECTOR 4P	

****

*1-630-454-11 ZM-10 BOARD (Ref.No 3,000 Series)

****

SWITCH

Ref.No	Part No.	Description	Remark
S970	1-571-315-11	SWITCH, KEY BOARD (TELE)	
S971	1-571-315-11	SWITCH, KEY BOARD (WIDE)	

****

*A-7070-860-A SW-111 BOARD, COMPLETE (Ref.No 3,000 Series)

****

CONNECTOR

Ref.No	Part No.	Description	Remark
CN930	*1-565-882-11	PIN, CONNECTOR (PC BOARD) 10P	
CN931	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	

JACK

Ref.No	Part No.	Description	Remark
J930	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J931	1-507-921-00	JACK (EARPHONE)	

COIL

Ref.No	Part No.	Description	Remark
L930	1-410-369-11	INDUCTOR CHIP 1UH	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L932	1-410-369-11	INDUCTOR CHIP 1UH	
		RESISTOR	
R910	1-216-295-00	METAL GLAZE 0 5% 1/10W	
		SWITCH	
S930	1-553-977-00	SWITCH, SLIDE (STANDBY)	
S931	1-571-838-11	SWITCH, TACTIL (REC START/STOP)	

* * *

*A-7070-865-A PA-24 BOARD, COMPLETE (Ref.No 3,000 Series)

Ref.No	Part No.	Description	Remark
		DIODE	
D990	8-719-938-72	DIODE SB01-05CP-TA	
		FUSE	
F990 ⚠	1-532-778-21	FUSE, MICRO (SECONDARY)	
F991 ⚠	1-532-778-21	FUSE, MICRO (SECONDARY)	
		BATTERY HOLDER	
J991	1-550-104-32	HOLDER, BATTERY	
		COIL	
L990	1-412-026-11	INDUCTOR CHIP 1UH	
L991	1-412-026-11	INDUCTOR CHIP 1UH	
L992	1-412-026-11	INDUCTOR CHIP 1UH	
		SWITCH	
S990	1-570-870-21	SWITCH, SLIDE (EDIT)	
		CONNECTOR	
W991	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 5P	
W992	1-535-658-11	TERMINAL BOARD	

* * *

MISCELLANEOUS

Ref.No	Part No.	Description	Remark
	A-7090-879-A	FILTER BLOCK, OPTICAL (OFB-02-01)	
	1-464-993-11	CONVERTER, DC-DC	
	1-535-574-11	TERMINAL, SHAFT GROUND	
	*1-535-622-11	PIN, TERMINAL	
	1-542-101-11	MICROPHONE (C-2020) (CCD-F50)	
	*1-542-125-11	MICROPHONE (C-2027) (CCD-F70)	
	1-574-462-11	CABLE, FLAT (1.0MM PITCH) 15P	
	1-626-233-11	FP-124 FLEXIBLE BOARD	
	1-807-238-11	SENSOR, DEW CONDENSATION	
※IC600	A-7090-878-A	IC ICX026AK-2 (CCD IMAGER)	
J360	1-568-409-11	JACK, PIN 2P (AUDIO IN)	
J361	1-537-142-11	TERMINAL BOARD (AUDIO OUT)	

Ref.No	Part No.	Description	Remark
L951 ⚠	1-451-310-21	DEFLECTION YOKE (B/W)	
M902	8-835-309-01	MOTOR, DC BHF-3301C (CAPSTAN)	
M903 ⚠	1-541-508-11	MOTOR, DC (LA14-323F)	
M904	3-707-442-01	METER, IG	
M906	3-707-452-01	MOTOR UNIT, PZ	
S902	1-553-226-00	SWITCH, LEAF (CASSETTE DOWN)	
V901 ⚠	1-546-065-11	CATHODE-RAY TUBE, B/W (M01JVV47WB)	

* * *

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
*3-340-514-01	BAG, PROTECTION	
*3-730-891-01	CUSHION (UPPER)	
*3-730-892-01	CUSHION (LOWER)	
3-750-275-21	MANUAL, INSTRUCTION (CCD-F50)	
3-786-986-21	MANUAL, INSTRUCTION (CCD-F70)	
	ACCESSORIES AND PACKING MATERIALS (KIT)	
A-6767-701-A	RF UNIT (RFU-89UCA)	
1-506-657-11	ADAPTOR, CONVERTION, ACC	
1-559-354-21	CORD, CONNECTION, ACC	
3-786-154-23	MANUAL, INSTRUCTION (AC ADAPTOR)	
**	ADAPTOR ASSY, AC (.A-4920-183-A)	
***	BATTERY PACK	

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS A OPTIONAL ACCESSORIES.

* * *

HARDWARE LIST

Part No.	Description
	SCREW
7-621-255-15	SCREW +P 2X3
7-621-255-45	SCREW +P 2X6
7-621-281-15	SCREW +P 2X2
7-621-772-00	SCREW +B 2X3
7-627-850-17	SCREW, PRECISION +P 1.4X2.5
7-627-552-07	SCREW, PRECISION +P 1.7X2.5
7-627-852-18	SCREW, PRECISION +P 1.7X4 TYPE3
7-627-852-38	SCREW, PRECISION +P1.7X1.8TYPE3
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3
7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT
7-685-203-19	SCREW +KTP 2X5 TYPE2 NON-SLIT
	STOP RING
7-624-101-01	STOP RING 1.2 (E TYPE)
7-624-102-04	STOP RING 1.5, TYPE -E
	TAPPING
7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT

* * *

※For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

When indicating parts by reference number, please include the board name.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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CCD-F50/F70

SONY®
SERVICE MANUAL

US Model
Canadian Model

SUPPLEMENT-1

Adjustment

File this supplement with the Service Manual.

- **For Mechanical Block Adjustment.**
  For the adjustment and checking of mechanical units and the method of replacing mechanical parts not described in this Service Manual, refer to the separately supplied "8mm Video Mechanical Unit Adjustment Manual Type III (0' Mechanism)".

- When adjustment the mechanical unit by removing the camera unit, disconnect the connector according to "Precaution for Adjustment" (Page 23) described in "SECTION 3. Electrical Adjustment" and then supply 6.5±0.1Vdc to the battery terminal from the stabilized power supply.

TABLE OF CONTENTS

Section *Title* *Page*

1. CAMERA BLOCK ADJUSTMENT

1-1. List of Servicing Jigs 3
1-2. Preparations 4
1-3. Cautions 5
1-4. Camera System Adjustment 6
1-4-1. Flange Back Adjustment 6
1-4-2. DC-DC Converter Voltage Check 7
1-4-3. Voltage Adjustment 7
1-4-4. IRIS Set Adjustment 7
1-4-5. AGC Set Adjustment 8
1-4-6. Matrix Adjustment (1) 8
1-4-7. Matrix Adjustment (2) 8
1-4-8. Matrix Adjustment (3) 9
1-4-9. Y_H Level Adjustment 9
1-4-10. Chroma Level Adjustment 9
1-4-11. Brust Level Adjustment 9
1-4-12. Pre-white Balance Adjustment (1) 10
1-4-13. Pre-white Balance Adjustment (2) 10
1-4-14. Color Reproducibility Adjustment (Using vector scope) 10
1-4-15. Color Reproducibility Adjustment (Using Oscilloscope) 11
1-4-16. SET UP Adjustment 11
1-4-17. SYNC Level Adjustment 12
1-4-18. White Clip Adjustment 12
1-4-19. Y Level Adjustment 12
1-4-20. Aperture Adjustment 13
1-4-21. Max Gain Adjustment 13
1-4-22. Automatic White Balance Adjustment 13
1-4-23. Automatic White Balance Check 14
1-4-24. Backlight Correction Check 14
1-5. Auto Focus Adjustment 14
1-5-1. AF Measurement Distance Adjustment 14
1-6. Digital Titler Block Adjustment 15
1-6-1. AD Converter Level Adjustment 15
1-6-2. Chroma Blanking Level Adjustment 15
1-6-3. Y Level of Titler Adjustment 15
1-6-4. PLL Error Voltage Adjustment 15
1-7. Parts Location Diagramrelevant to the Adjustments 16

2. MECHANICAL SYSTEM ADJUSTMENT

2-1. How to Disassemble Lens Unit 19
2-1-1. How to Remove Camera Frame 19
2-1-2. How to Remove AF Board 19
2-1-3. How to Remove Focus Motor and Zoom Motor 19
2-1-4. How to Remove AF Block 20
2-1-5. How to Remove Relay Lens Cylinder Unit 20
2-1-6. How to Remove IRIS Motor 20
2-1-7. How to Remove IRIS Blades 21
2-1-8. How to Remove Zoom Ring 21
2-1-9. How to Mount Zoom Ring 21
2-2. LS CAM Plate Adjustment Procedure 22

3. ELECTRICAL ADJUSTMENT

3-1. Power Supply Check 30
3-1-1. VA 5V Voltage Check 30
3-2. System Control Adjustment 30
3-2-1. Battery Down Adjustment 30
3-2-2. Clock Accuracy Check 30
3-3. Servo System Adjustment 31
3-3-1. Switching Position Adjustment 31
3-4. Video Adjustment 31
3-4-1. Playback Frequency Characteristics Adjustment 32
3-4-2. Flying Erase Check 32
3-4-3. Y/C Separation Adjustment 32
3-4-4. IR2 Adjustment 33
3-4-5. Emphasis Input Level Adjustment 33
3-4-6. Video Out Level Adjustment 33
3-4-7. PB Y Level Adjustment 34
3-4-8. Y_D Adjustment 34
3-4-9. Y FM Carrier Frequency Adjustment 34
3-4-10. Y FM Deviation Adjustment 35
3-4-11. Chroma Emphasis fo Adjustment 35
3-4-12. REC Y Record Current Adjustment 35
3-4-13. REC C Recording Current Adjustment 36
3-4-14. Indicated Position in EVF Adjustment 36
3-5. Audio System Adjustment 36
3-5-1. E-E Output Level Check 36
3-5-2. Overall Level Characteristics Check 36
3-5-3. Overall Distortion Factor Check 37
3-5-4. Overall Noise Level Check 37
3-6. Electronic Viewfinder System Adjustment 37
3-6-1. Adjusting Horizontality/Inclination 37
3-6-2. Centering Adjustment 38
3-6-3. AFC Adjustment 38
3-6-4. Horizontal Amplitude Adjustment 38
3-6-5. Vertical Amplitude Adjustment 39
3-6-6. Brightness /Contrast Adjustment 39
3-6-7. Focus Adjustment 39
3-6-8. Horizontal Amplitude and Vertical Amplitude Check 39
3-7. Parts Location Diagramrelevant to the Adjustment. 40

SECTION 1
CAMERA BLOCK ADJUSTMENT

See the adjusting part location diagram from on page 16 for the adjustment.

PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

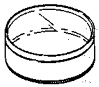
1-1. LIST OF SERVICING JIGS

- Oscilloscope
- AC pack
- Adjust screw driver
- L-Shaped wrench
- Stop watch
- Color monitor
- Vectorscope

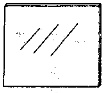
Ref. No.	Name	Part No.	Use
J-1	Filter (C22)	J-6080-829-A	Automatic white balance check
	Filter (for fine weather)	J-6080-058-A	Pre-white balance adjustment (2)
J-2	ND filter 0.4	J-6080-806-A	IRIS set adjustment, LLA adjustment
	ND filter 0.1	J-6080-807-A	IRIS set adjustment, LLA adjustment
	ND filter 1.0	J-6080-808-A	MAX. gain adjustment, LLA adjustment (use 2 pcs)
J-3	Pattern box PTB-500 * 1	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Flat extension cable (15P)	J-6082-019-A	Use 1 pce
J-6	Extension cable (7P)	J-6080-917-A	Use 1 pce
	Extension cable (4P)	J-6082-042-A	Use 1 pce
	Extension cable (7P)	J-6080-886-A	Use 1 pce
	Extension cable K (2P)	J-6080-873-A	Use 1 pce
	Extension cable (3P)	J-6082-041-A	Use 1 pce
	Extension cable (5P)	J-6082-043-A	Use 1 pce
J-7	Lens fixing jig	J-6080-894-A	
J-8	Siemens-star	J-6080-875-A	Flange back adjustment
J-9	Sign chart	J-6080-876-A	

* 1 PTB-100 (J-6020-490-A) can also be used.

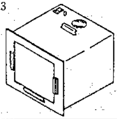
J-1



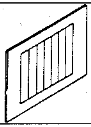
J-2



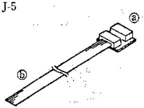
J-3



J-4

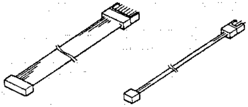


J-5

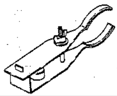


(11P Flexible)

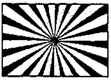
J-6



J-7



J-8



J-9

Fig. 1-1.

1-2. PREPARATIONS

Note : For move details regarding how to remove the cover and individual boards, refer to the Service Manual "1 Disassembly" of main unit.

1) Remove the camera cover, VTR panel and cabinets (left and right.)
2) Separate the camera unit from the video unit.
3) Open the camera board and fix the camera fixing jig by referring to the Service Manual, Main Unin, "2 Disassembly and 2-5. Removal of VC-61 board to VC-63 board" (Refer to Fig. 1-2).
4) Since the video block should be connected for the adjustment and checking, connect the extension cable as shown in Fig. 1-3.

Note 1 : In this case, EVF (Electric View Finder) should also be connected to VA-42 board CN360.

Note 2 : When the oscilloscope is used for the measurement and unless specified otherwise, EXT TRIG terminal and VC-63 terminal CN705 ⑧ pin (ID) should be connected for the synchronization.

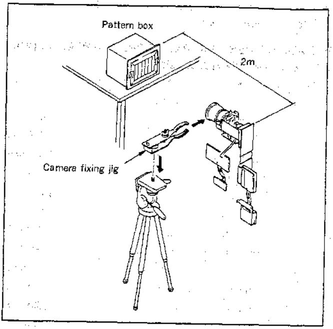

Pattern box
2m
Camera fixing jig

Fig. 1-2.

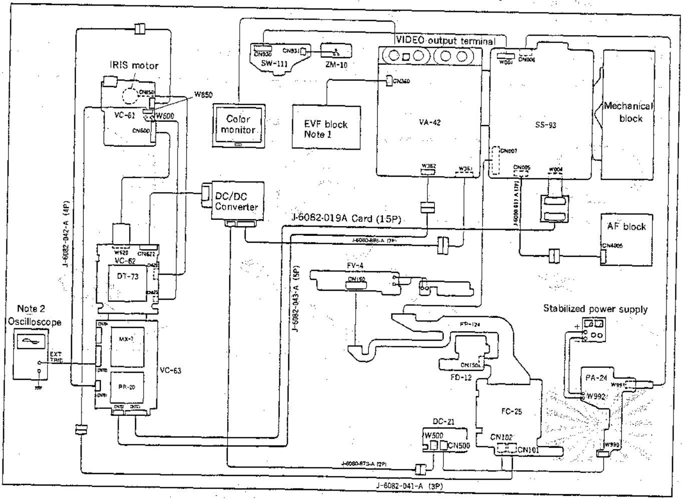

VIDEO output terminal
CN930
CN931
SW-111
ZM-10
IRIS motor
CN850
W850
VC-61
W600
CN600
Color monitor
EVF block
Note 1
CN360
VA-42
W001
CN006
SS-93
Mechanical block
CN007
W362
W361
CN005
W004
DC/DC Converter
J-6082-019A Card (15P)
J-6080-017-A (17P)
AF block
CN4005
J-6082-042-A (4P)
J-6080-886-A (7P)
W620
CN622
VC-62
DT-73
FV-4
CN160
J-6082-043-A (5P)
Note 2
Oscilloscope
EXT TRIG
MX-7
PR-20
VC-63
FP-124
Stabilized power supply
+
−
CN150
FD-12
PA-24
W991
W992
FC-25
DC-21
W500
CN500
CN102
CN101
W990
J-6080-873-A (2P)
J-6082-041-A (3P)

Fig. 1-3.

1-3. CAUTIONS

1) Setting switches (only when the video unit is connected). Unless specified otherwise, set the switches to the following positons for adjustments;
   1. AUTO LOCK switch (FC-25 board S114)
      ......Manual (Lower side).

2) Adjusting sequence
   In principle, follow the indicated sequence.

3) Subjects
   1. Color bar chart (standard picture frame).
      When the color bar chart is used for the adjustment, adjust the picture frame as shown in Fig 1-4 (standard picture frame).

Color bar chart standard picture frame

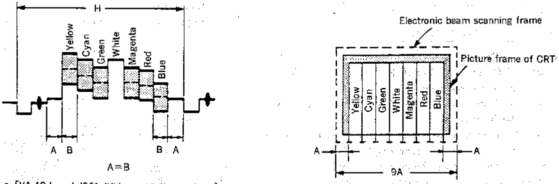

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
B A
A=B
Electronic beam scanning frame
Picture frame of CRT
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
A
9A

Fig. a [VA-42 board J361 (Video output) waveform]

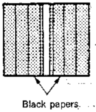
Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera in such a way that the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b are obtained.

Fig. 1-4.

2. Full white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (72mm).
3. High luminance pattern
   Prepare the high luminance pattern as shown in Fig. 1-5. and adjust the picture frame as shown in Fig. 1-6.
4. Siemens star (J-6080-875-A)
   Adjust the camera direction is such a way that the center of Siemens star coinsides with the center of monitor screen on the monitor TV screen.

High luminance pattern


Black papers.

Cover the color bar chart with block papers, except a half of the width of white stripe and then display in the standard picture frame.

Fig. 1-5.

High luminance pattern

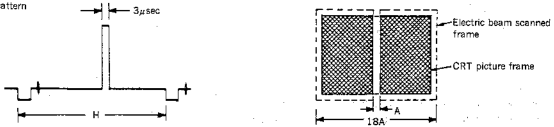

3μsec
H
Electric beam scanned frame
CRT picture frame
A
18A

Fig. a [VA-42 board J361 (picture output) waveform]

Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera until the output waveform of Fig. a and the monitor TV picture of Fig. b are displayed.

Fig. 1-6.

1-4. CAMERA SYSTEM ADJUSTMENT

1-4-1. Flange Back Adjustment

Subject	Siemens star (Position located 2 meters forward from the front of lens)
Measuring point	Checked with a monitor TV.
Measuring equipment	
Adjustment element	Adjust screw
Tools	Screw driver

[Adjustment Procedure]

1) Set AUTO LOCK SWITCH (FC-25 board S114) to "Manual" position (Lower side.)
2) Set the Siemens star at the position 2 meters forward from the front of lens.
3) Adjust the position of camera block in such a way that the center of Siemens star displayed on the monitor screen coincides with the center of monitor screen.
4) Make sure that the lens zoom lever smoothly moves to the extreme end of WIDE (8.5mm) and the extreme end of TELE (68mm) and then set the lever at the extreme end of WIDE (make sure that the zooming operation is functioning on the monitor screen at this time).
5) Open the IRIS by operating the backlight correcting switch (FC-25 board S109).
6) The end surface of "∞" side of stopper-rubber should be set on the center of the 3 lines marked on the main lens cylinder (Refer to Fig. 1-7).

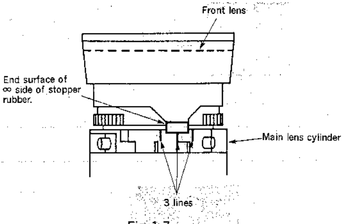


Fig. 1-7.

7) Loosen the setscrew (Refer to Fig. 1-8).
8) Insert a minus screw driver through the hole on rear lens cylinder and slightly turn the master lens frame with the edge of screw driver.
9) By turning the adjust screw, set the focus until the chart contrust becomes maximum (keep the setscrew loose at this time).
10) Readjust the focus by turning the focus ring.
11) Make sure that the ends of ∞ side of stopper rubber are kept within the range of 3 lines marked on the main lens cylinder (If not within the range, repeat the above 8) and 9)).
12) While holding the adjust screw, thus preventing it from turning, tighten the setscrew [If the position deviates, repeat the process starting from 6)] .
13) Repeat the adove 10) and 11) and check.

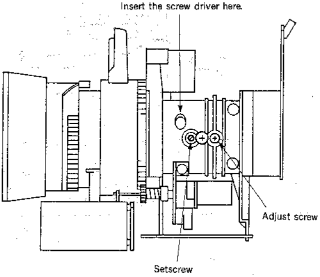


Fig. 1-8.

1-4-2. DC-DC Converter Voltage Check (VC-62 board)

Measuring equipment	Digital voltmeter
5V check	
Specified value	5.00±0.05Vdc
Measurement point	CN622 pin ①
15Vcheck	
Specified value	15.0±0.3Vdc
Measuring point	CN622 pin ④
32Vcheck	
Specified value	32.0±0.5Vdc
Measuring point	CN622 pin ⑤

Note : Connect EVF unit before checking.

[Check Procedure]

1) Make sure that each power supply voltage meets the specified value.

1-4-3. Voltage Adjustment (VC-61 board)

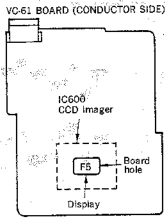
Subject	Arbitrary
Measurement point	CN601 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV600
Specified value	(Imager specified voltage) ±0.05Vdc

[Adjustment Procedure]

1) Set the voltage to (imager specified voltage)±0.05Vdc with RV600.

Note : V_{SUB}, specified voltage, is displayed on the imager with two digits: "integer symbol" and "decimal".

Integer Symbol	Integer Value
1	1
⋮	⋮
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19
K	20
L	21



(EXample)
For F5 display, integer symbol is F →15, and decimal value is 5→0.5 so V_{SUB} Voltage is 15+0.5=15.5 (Vdc).

Fig. 1-9.

1-4-4. IRIS Set Adjustment (VC-62 board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement point	VC-61 board CN601 pin ① (CCD OUT)
Measurement element	Oscilloscope
Adjustment element	RV622 (IRIS)
Specified value	200±5mVp-p

[Adjustment Procedure]

1) Adjust the signal level to 200±5mVp-p with RV622. Do not use ND filter at this time.
(Be sure to complete the adjustment by turning RV622 in the direction where the level is reduced).
2) Set ND filter 0.5 (0.4+0.1) on the front of lens and make sure that the signal level changes smoothly.
3) Remove ND filter and make sure that the signal level is within 200±15mV.
4) If the specified value is not met by these adjustment, repeat the above steps, 1) to 3).

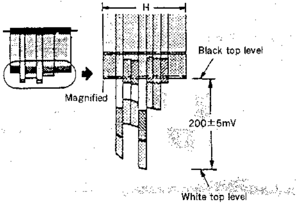


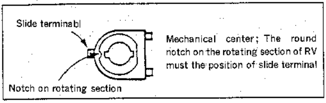
Fig. 1-10.

1-4-5. AGC Set Adjustment (VC-62 board)

Subject	Color bar chart standard picture frame
Measurement point	VC-63 board CN704 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV621
Specified value	160±5mVp-p

Note 1 : RV located next to VC-62 board should be set to the mechanical center before starting the adjusting operation.

1. RV620 (MAX GAIN)


Slide terminabl
Mechanical center; The round notch on the rotating section of RV must the position of slide terminal
Notch on rotating section

Note 2 : When the adjustment is completed, be sure to perform "1-4-21. Max Gain Adjustment".

[Adjustment Procedure]

1) With RV621, adjust the signal level within 160±5mVp-p.

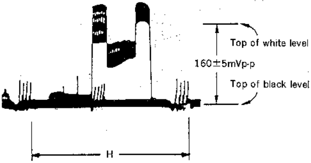


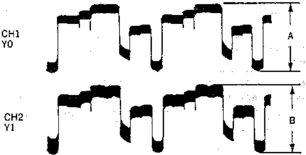
Fig. 1-12.

1-4-6. Matrix Adjustment (1) (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63 board CN704 pin ④ (Y_0) CH2 : VC-63 board CN704 pin ⑤ (Y_1)
Measuring equipment	Oscilloscope
Adjustment element	RV706 (Y_1 Gain)
Specified value	Levels of Y_0 and Y_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV706 in such a way that the levels of Y_0 (CH1) and Y_1 (CH2) coincide with each other.



Adjust to A=B.

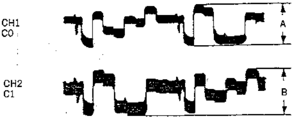
Fig. 1-13.

1-4-7. Matrix Adjustment (2) (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63 board CN704 pin ⑥ (C_0) CH2 : VC-63 board CN704 pin ⑦ (C_1)
Measuring equipment	Oscilloscope
Adjustment element	RV707 (C_1 GAIN)
Specified value	Levels of C_0 and C_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV707 in such a way that the levels of C_0 (CH1) and C_1 (CH2) coincide with each other.



Adjust to A=B

Fig. 1-14.

1-4-8. Matrix Adjustment (3) (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV705 (C_2 Gain)
Specified value	Minimize breaking of luminescent spot in each color.

[Adjustment Procedure]

1) Adjust RV705 in such a way that the liminous point of each color is kept within 1 point or nearly 1 point.

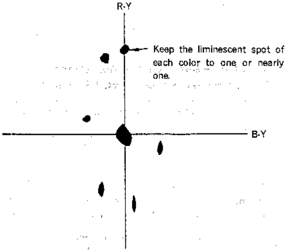

R-Y
Keep the liminescent spot of each color to one or nearly one.
B-Y

Fig. 1-15.

1-4-9. Y_H Level Adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ④ (Y_H OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV701 (Y_H LEVEL)
Specified value	900±10mVp-p

[Adjustment Procedure]

1) Adjust RV701 in such a way that the white level is kept within 900±10mVp-p.

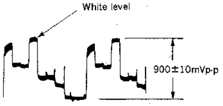


Fig. 1-16.

1-4-10. Chroma Level Adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ② (Gr/G WB)
Measuring equipment	Oscilloscope
Adjustment element	RV710 (C LEVEL)
Specified value	320±10mVp-p

[Connection]

1) Before making adjustment, VC-63 board CN705 pin ③ and GND should be short circuited with a jumper.

[Adjustment Procedure]

1) Adjust RV710 until 320±10mVp-p is obtained.
2) After the adjustment, disconnect the jumper.

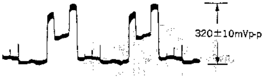


Fig. 1-17.

1-4-11. Brust Level Adjustment (VC-63 board)

Subject	All black (Cover the lens with black cap
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV722
Specified value	180±5mVp-p

[Adjustment Procedure]

1) Adjust RV722 until the the brust level becomes 180±5mVp-p.

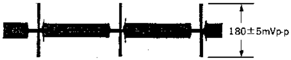


Fig. 1-18.

1-4-12. Pre-white Balance Adjustment (1) (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV708 (R Gain), RV709 (B Gain)
Specified value	Minimize the carrier of white portion

[Adjustment Procedure]

1) The carrier of white portion is minimized by RV708 and RV709.

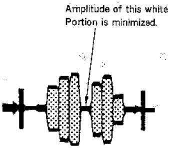


Fig. 1-19.

1-4-13. Pre-white Balance Adjustment (2) (VC-63 board)

Subject	All white pattern
Filter	Filter (for fine weather)
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV725 (R CONT), RV726 (B CONT)
Specified value	Set the white luminescent spot at the center

[Adjustment Procedure]

1) Set the filter (for fine weather) and adjust RV725 and RV726 so that the white luminescent point is set at the center.

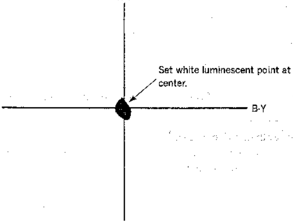


Fig. 1-20.

1-4-14. Color Reproducibility Adjustment (Using vectorscope) (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	VA-42 board J361 (VIDEO OUT)
Measuring equipment	Vectorscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN) RV712 (B-Y HUE), RV713 (R-Y HUB)
Specified value	Each color's luminescent spot must be within the frame of color reproducibility. (Fig. 1-21)

[Adjustment Procedure]

1) By alternately turning RV714, RV715, RV712 and RV713, adjust the luminescent spot of each color until it is held within the frame of color reproducibility.

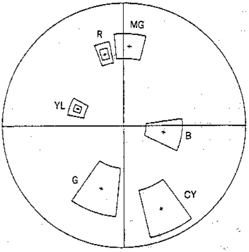
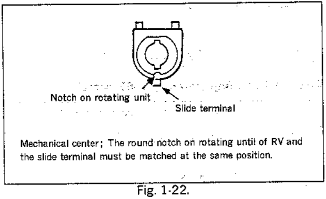


Fig. 1-21.

1-4-15. Color Reproducibility Adjustment (Using Oscilloscope)

A. Gain adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN)
Specified value	"Red" level : 340±20mVp-p "Yellow" level : 240±15mVp-p



Mechanical center; The round notch on rotating until of RV and the slide terminal must be matched at the same position.

Fig. 1-22.

[Adjustment Procedure]

1) Set RV712 (B-Y HUE) and RV713 (R-Y HUE) on the mechanical center (Refer to Fig. 1-22).
2) Adjust the amplitude of "Red" to 340±20mVp-p by RV715.
3) Adjust the amplitude of "Yellow" to 240±15mVp-p by RV714.

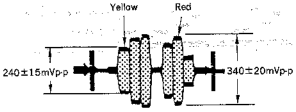


Fig. 1-23.

B. HUE Adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y mode)
Adjustment element	RV712 (B-Y HUE), RV713 (R-Y HUE)
Specified value	Each color luminescent spot must be within the frame of color reproducibility.

[Adjustment Procedure]

1) Adjust RV712 and RV713 until the luminescent spot of R and Y_L is set within the frame of color reproducibility.

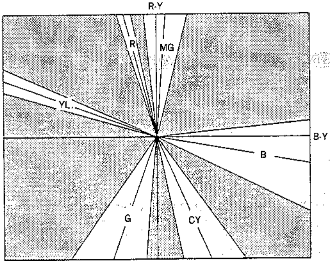


Fig. 1-24.

1-4-16. SET UP Adjustment (VC-63 board)

Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV719
Specified value	50±5mVp-p

[Adjustment Procedure]

1) Adjust SET UP level to 50±5mVp-p by RV719.

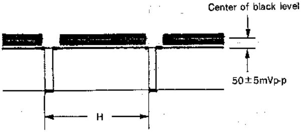


Fig. 1-25.

1-4-17. SYNC Level Adjustment (VC-63 board)

Subject	All black (Cover the lens with black cap)
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV720
Specified value	285±5mVp-p

[Adjustment Procedure]

1) Adjust SYNC level to 285±5mVp-p by RV720.

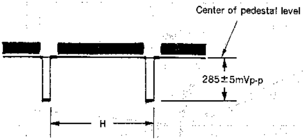

Center of pedestal level
285±5mVp-p
H

Fig. 1-26.

1-4-18. White Clip Adjustment (VC-63 board)

Subject	High luminance pattern
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV718
Specified value	840±20mVp-p

Note: Set RV717 as shown in Fig. 1-27.

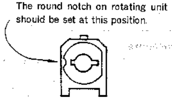

The round notch on rotating unit should be set at this position.

Fig. 1-27.

[Adjustment Procedure]

1) Set the signal level to 840±20mVp-p by RV718.
2) Adjust the Y level.

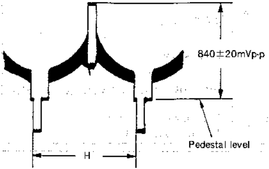

840±20mVp-p
Pedestal level
H

Fig. 1-28.

1-4-19. Y Level Adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ③ (Y OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV717
Specified value	660±10mVp-p

[Adjustment Procedure]

1) Set the Y level to 660±10mVp-p by RV717.

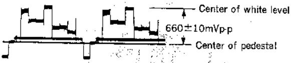

Center of white level
660±10mVp-p
Center of pedestal

Fig. 1-29.

1-4-20. Aperture Adjustment (VC-63 board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ③ (Y OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV716
Specified value	50±5mV

[Adjustment Procedure]

1) By adjusting RV716, set the peak between "Magenta" and "White" and the center of white level to 50±5mV.

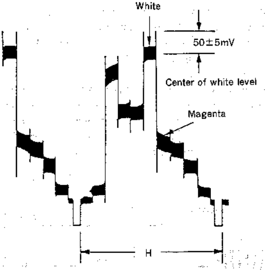


Fig. 1-30.

1-4-21. Max Gain Adjustment (VC-62 board)

Subject	Color bar chart standard picture frame
Filter	2 pcs of ND filter 1.0 and 1 pce of 0.4
Measurement point	CN702 pin ③ (VC-63 board)
Measuring equipment	Oscilloscope
Adjustment element	RV620
Specified value	360±10mVp-p

[Adjustment Procedure]

1) Set ND filter 2.4 (1.0+1.0+0.4) on the lens.
2) With RV620, adjust the gain to 360±10mVp-p

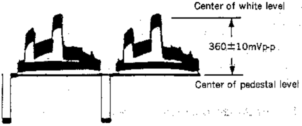


Fig. 1-31.

1-4-22. Automatic White Balance Adjustment (VC-61 board)

Subject	All white pattern ＊ Note: 1)
Measurement point	CH1 : CH850 pin ④ (R CONT) CH2 : CN850 pin ③ (B CONT)
Measuring equipment	Oscilloscope (DC range)
Adjustment element	RV850

Note: 1) The white balance sensor (VC-61 board SB850) should be arranged in such a way that the light enters through the white diffusion plate. The white lens cap of conventional type camera can be used for the white diffusion plate.

2) If any light other than the light from pattern box should enter the white balance sensor, proper adjustment can not be made. It is desirous to make adjustments in a darkroom, but if it is not possible to do so, take the following steps before making the required adjustments:

1. Place the camera unit on a black paper. (This process is also necessary when making adjustments in a darkroom, etc.).
2. Adjust the distance between camera unit and pattern box to less than 0.5m (Focusing is not required.)
3. Cover the white balance sensor with a black paper, ensuring that no other light, except the light from pattern box, enters the white balance sensor.

[Connection]

Make the following connections to set the unit in the test mode;

1) Both CN851 ① and ② pins on VC-61 board should be connected to GND with a jumper wire.

[Adjustment Procedure]

1) By turning RV850, make sure that CH1 indicates both "L" (0.5Vdc) and "H" (1.0Vdc) and CH2 indicates both "L" (1.0Vdc) and "H" (1.9Vdc).
2) Gradually turn RV850 and stop it when CH1 shows "L" (0.5Vdc) and CH2 shows "H" (1.9Vdc), respectively.

1-4-23. Automatic White Balance Check

Subject	All white pattern
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode

[Check Procedure]

1) Make sure that the white luminescent stop is at the original point.

1-4-24. Backlight Correction Check

Subject	Color bar chart standard picture frame
Measurement point	VA-42 board J361 (Video output terminal)
Measuring equipment	Oscilloscope

[Check Procedure]

1) Push the backlight correction button (FC-25 board S109).
2) Make sure that the output level increases.

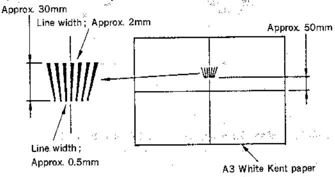
1-5. AUTO FOCUS ADJUSTMENT

1-5-1. AF Measurement Distance Adjustment

Subject	AF measurement adjust chart (Refer to Fig. 1-32)
Measurement point	Check with monitor TV.
Measuring equipment	Check with monitor TV.
Adjustment element	Measured distance adjust screw
Tool	Hexagonal wrench (1.25mm)

[Adjustment Procedure]

1) Set the chart at 2 meters forward from the front of lens.
2) Set the lens zoom lever on the TELE terminal and set the center of monitor on the center of chart.
3) Insert the hexagonal wrench into the hole located on the lower side of unit and set the focus by turning AF adjust screw (Refer to Fig. 1-33).
4) Remove the focus ring by turning it with your hand ensuring no overrunning of focus, that is, the focus is not deviated after it is properly set once when the ring is turned to ∞ side and the hand is released or when the ring is turned to 1.2m side and the hand is released.
5) When the focus overruns in the above 4), repeat the above 3) and 4).
6) Close the AF adjust hole of cabinet.



AF measuring chart

Fig. 1-32.

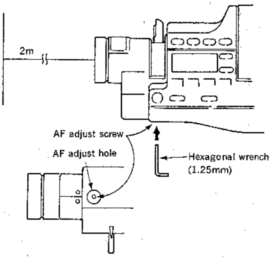


Fig. 1-33.

1-6. DIGITAL TITLER BLOCK ADJUSTMENT

1-6-1. AD Converter Level Adjustment (SS-93 board) (CCD-F70)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	⊕ Probe : IC203 pin ② ⊖ Probe : IC203 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV200
Specified value	375±5mVdc

[Adjustment Procedure]

1) Adjust the voltage to 375±5mVdc by RV200.

1-6-2. Chroma Blanking Level Adjustment (VC-63 board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV711
Specified value	Minimize the carrier

[Adjustment Procedure]

1) Push "Title 1" button (FC-25 board S101) or "Titl 2" button (FC-25 board S102).
2) Push "Memory" button (FD-12 board S153), thus memorizing "All black".
3) Select the white color by pushing the color button (FD-12 board S154).
4) Minimize the carrier by RV711.

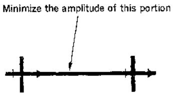

Minimize the amplitude of this portion

Fig. 1-34.

1-6-3. Y Level of Titler Adjustment (VC-63 board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap).
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV724
Specified value	570±10mVp-p

[Adjustment Procedure]

1) Push "Title 1" button (FC-25 board S101) or "Title 2" button (FC-25 board S102).
2) Push "Memory" button (FD-12 board S153), thus memorizing "All black".
3) Select the white color by pushing "color" button (FD-12 board S154).
4) By operating RV724, set the value to 570±10mVp-p.

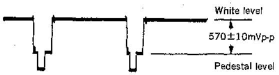

White level
570±10mVp-p
Pedestal level

Fig. 1-35.

1-6-4. PLL Error Voltage Adjustment (SS-93 board)

Mode	Camera stand-by
Subject	Arbitrary
Measurement point	Refer to Fig. 1-36
Measuring equipment	Digital voltmeter
Adjustment element	CT200
Specified value	2.50±0.05V

[Adjustment Procedure]

1) Push "Title 1" button (FC-25 board S101).
2) Make sure that IC202 pin ⑥④ is higher than 4.0V.
3) Push "Memory" button (FD-12 board S153).
4) By adjusting CT200, set the voltage of measured point (Refer to Fig. 1-36)

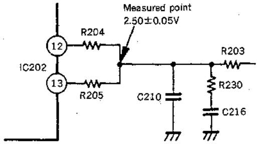
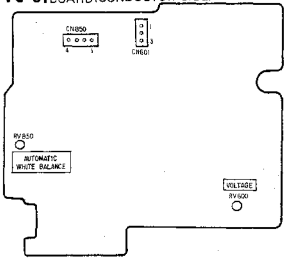

Measured point
2.50±0.05V
12
13
IC202
R204
R205
R203
R230
C210
C216

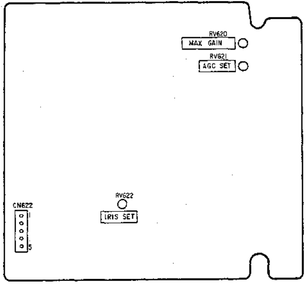
Fig. 1-36.

1-7. PARTS LOCATION DIAGRAMRELEVANT TO THE ADJUSTMENTS

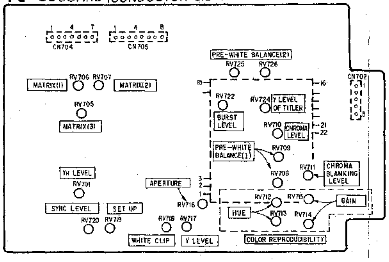
VC-61 BOARD(CONDUCTOR SIDE)


CN850
4
1
1
3
CN601
RV850
AUTOMATIC WHITE BALANCE
VOLTAGE
RV600

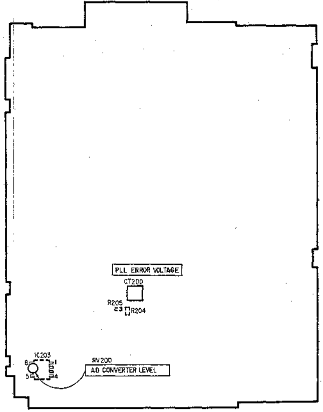
VC-62 BOARD (CONDUCTOR SIDE)


RV620
MAX GAIN
RV621
AGC SET
RV622
IRIS SET
CN622
1
5

VC-63 BOARD (CONDUCTOR SIDE)


1 4 7
CN704
1 4 8
CN705
PRE-WHITE BALANCE(2)
RV725
RV726
MATRIX(1)
RV706
RV707
MATRIX(2)
RV705
MATRIX(3)
15
16
RV722
BURST LEVEL
RV724
Y LEVEL OF TITLER
RV710
CHROMA LEVEL
21
22
PRE-WHITE BALANCE(1)
RV709
RV708
RV711
CHROMA BLANKING LEVEL
CN702
1
5
YH LEVEL
RV701
APERTURE
3
2
1
RV716
SYNC LEVEL
SET UP
RV720
RV719
RV718
RV717
WHITE CLIP
Y LEVEL
RV712
RV715
GAIN
HUE
RV713
RV714
COLOR REPRODUCIBILITY

SS-93 BOARD (CONDUCTOR SIDE)


PLL ERROR VOLTAGE
CT200
R205
R204
IC203
8
1
5
4
RV200
AD CONVERTER LEVEL

SECTION 2
MECHANICAL SYSTEM ADJUSTMENT

For mechanical adjustments, refer to the separate "8mm Video Mechanical Adjustment MANUAL" (9-972-607-11)

For disassembling the cabinet and each board, refer to the Service Manual, SECTION 2 Disassembly

2-1. HOW TO DISASSEMBLE LENS UNIT

2-1-1. How to Remove Camera Frame (Refer to Fig. 2-1)

1) Remove two screws ❶ and disassemble VC shield case ❷.
2) Remove camera frame ❸.
3) Remove screw ❹ and SW board ❺.
4) Remove ❹ screws ❻ and camera frame ❼.
5) Remove AF shield plate ❽ and AF cover ❾.

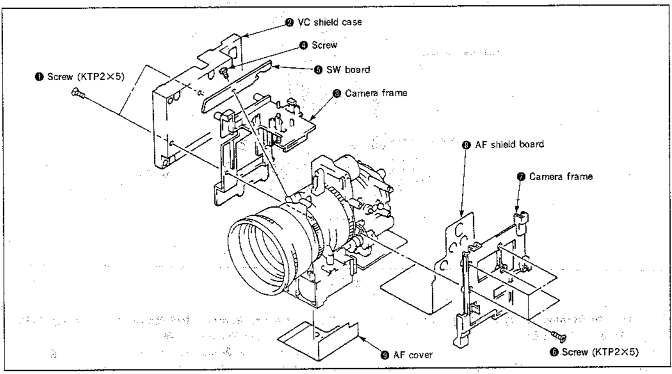

❷ VC shield case
❹ Screw
❺ SW board
❶ Screw (KTP2×5)
❸ Camera frame
❽ AF shield board
❼ Camera frame
❾ AF cover
❻ Screw (KTP2×5)

Fig. 2-1.

2-1-2. How to Remove AF Board (Refer to Fig. 2-2)

1) Remove screw ❶ and then remove AF board ❷.
2) Remove 4 connectors ❸.

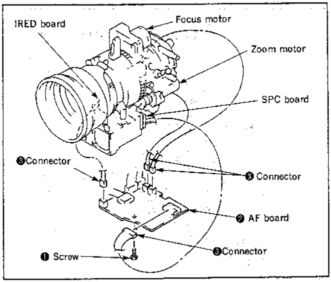

IRED board
Focus motor
Zoom motor
SPC board
❸Connector
❸ Connector
❷ AF board
❶ Screw
❸Connector

Fig. 2-2.

2-1-3. How to Remove Focus Motor and Zoom Motor (Refer to Fig. 2-3)

1) Remove screw ❶ and than remove zoom motor ❷.
2) Remove screw ❸ and then remove focus motor ❹.

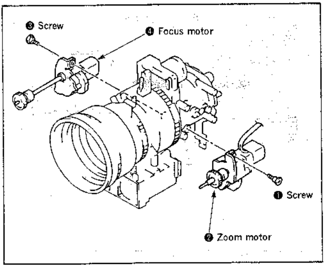

❸ Screw
❹ Focus motor
❶ Screw
❷ Zoom motor

Fig. 2-3.

2-1-4. How to Remove AF Block (Refer to Fig. 2-4)

1) Remove 2 screws ❶ and then remove AF block ❷.

Note : The screw on the IRED lens cylinder side is covered with a tape and can not be seen. Be sure to affix the tape when reassembling.

Note : When mounting AF block, make sure that the distance ring can surface ⓐ and prism arm ⓑ are properly assembled.

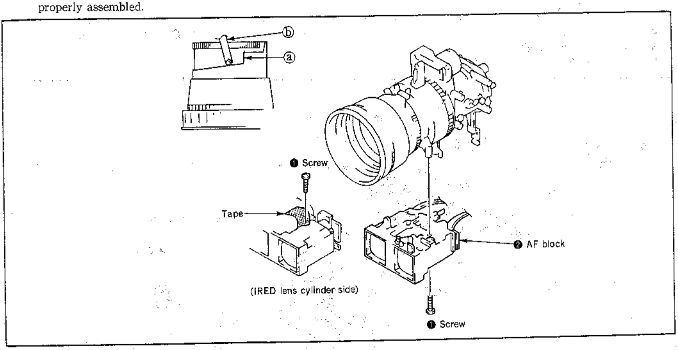

ⓑ
ⓐ
❶ Screw
Tape
❷ AF block
(IRED lens cylinder side)
❶ Screw

Fig. 2-4.

2-1-5. How to Remove Relay Lens Cylinder Unit (Refer to Fig. 2-5)

1) Remove 2 screws ❷.
2) Remove eccentric roller ❷ and then remove relay lens cylinder unit ❸.

Note : After reassembling, be sure to adjust the back focus.

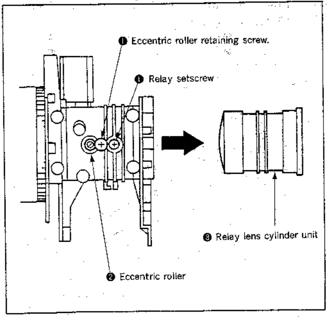

❶ Eccentric roller retaining screw.
❶ Relay setscrew
❸ Relay lens cylinder unit
❷ Eccentric roller

Fig. 2-5.

2-1-6. How to Remove IRIS Motor (Refer to Fig. 2-6)

1) Remove light shield plate ❶.
2) Remove screw ❷ and then remove IRIS motor ❸.

Note : Make sure not to deform the iris blades after removal. Iris blades are easily removed from the blade studs. keep them inserted properly
(Do not directly touch blades with hands. Use a pair of tweezers).
(Refer to 2-1-7. How to Remove Iris Blades).

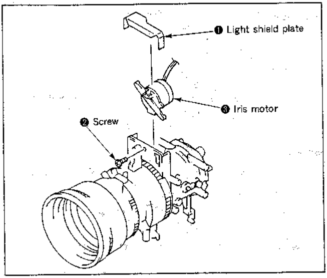

❶ Light shield plate
❸ Iris motor
❷ Screw

Fig. 2-6.

2-1-7. How to Remove Iris Blades (Refer to Fig. 2-7).

1) Remove the iris motor (Refer to 2-1-6. How to remove iris motor).
2) Set each blade stud into ⓐ section of iris blade A and remove iris blade A.
3) Remove iris blade B in the same manner.

Note : Make sure not to directly touch the blade with hands. Use a pair of tweezers.

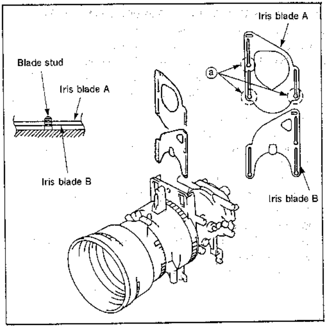

Iris blade A
Blade stud
Iris blade A
ⓐ
Iris blade B
Iris blade B

Fig. 2-7.

2-1-8. How to Remove Zoom Ring (Refer to Fig. 2-8)

1) Remove the camera frame, AF board, focus motor, zoom motor and AF block (Refer to 2-1-1~2-1-4).
2) Remove screw ❶ and then remove N stopper ❷.
3) Remove focus lens assy ❸.
4) Peel off zoom seat ❹.
5) While holding the focus side downward, remove 3 screws ❺.
6) Set the focus side upward without removing fixed lens cylinder ❻.
7) While keeping the zoom on the telescope side, remove 2 screws ❼.
8) Remove fixed lens cylinder ❻ by lifting it straight up.
9) Remove zoom ring ❽ and cam ring ❾ from the fixed lens cylinder.

2-1-9. How to Monut Zoom Ring (Refer to Fig. 2-8)

1) Set cam ring ❾ and zoom ring ❽ on fixed lens cylinder ❻.
   Note : Match a of cam ring to that of zoom ring.
2) Slowly install fixed lens cylinder ❻ from directly above.
   Note : Set ⓑ of relay holder into each positioning hole of fixed lens cylihder.
3) Set the zoom on the telescope side and tighten two screws ❼.
   Note : Move the zoom between telescope and wise angle, ensuring that the zoom moves smoothly.
4) While not removing the fixed lens cylinder and setting the focus side downward, tighten 3 screws ❺.
5) Mount focus lens assy ❸ on the fixed lens cylinder.
6) Mount N stopper ❷ and tighten screw ❶.
7) Affix zoom seat ❹.
8) Mount AF block, zoom motor, focus motor, AF board and camera frame (Refer to 2-1-1~2-1-9).
9) Check the AF measurement distance. Adjust it if deviated (Refer to 1-5-1 AF measurement distance adjustment).

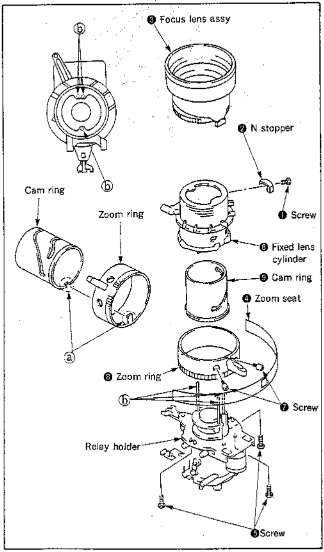

❸ Focus lens assy
ⓑ
❷ N stopper
Cam ring
ⓑ
Zoom ring
❶ Screw
❻ Fixed lens cylinder
❾ Cam ring
❹ Zoom seat
ⓐ
❽ Zoom ring
ⓑ
❼ Screw
Relay holder
❺Screw

Fig. 2-8.

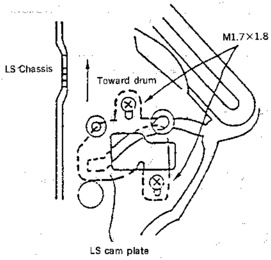
2-2. LS CAM PLATE ADJUSTMENT PROCEDURE

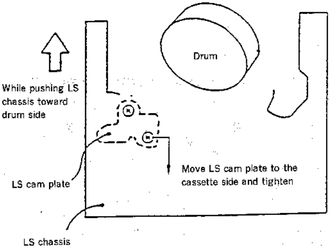
This method is required when LS chassis, LS cam plate, mechanical chassis or LS gear C is replaced.

Note : When LS chassis, LS cam plate, mechanical chassis or LS gear is replaced, make adjustments according to the following adjust procedures ;

LS cam plate adjustment

1. Temporarily set LS cam plate on the rear side of LS chassis and apply grease in the groove (set on the drum side with 2 screws, M1.7×1.8).
2. When LS chassis has been mounted on the mechanical chassis ;
   - ❶ Loosen the two screws, M1.7×1.8
   - ❷ and while pushing LS chassis toward the drum side,
   - ❸ Move LS cam plate toward the set side (opposite side of drum) and tighten the screws.


M1.7×1.8
LS Chassis
Toward drum
LS cam plate


Drum
While pushing LS chassis toward drum side
Move LS cam plate to the cassette side and tighten
LS cam plate
LS chassis

SECTION 3
ELECTRICAL ADJUSTMENT

See the adjustment part location diagram from on page 40 for the adjustment.

The following measuring instruments are needed in adjusting the VTR section.

[Equipment Required]

1) Monitor TV.
2) Oscilloscope with 2 phenomena; more than 10MHz of band width and delay mode (unless specified otherwise, the 10 : 1 probe should be used.)
3) Frequency counter
4) Pattern generator with Video output terminal.
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tapes

For tracking adjustment (WR5-1N)
  Part Code : 8-967-955-01
For Video frequency characteristics adjustment (WR5-6N)＊1
  Part Code : 8-967-955-12
For operation check (WR5-4NL)＊2
  Part Code : 8-967-955-51
(WR5-4NSP)＊3
  Part Code : 8-967-955-41

＊1 : WR5-2N can be used.
＊2 : WR5-3NL can be used.
＊3 : WR5-3NSP can be used.

[Precaution for Adjustment]

Except the "Battery down adjustment" used for the adjustment of system control and the "Inside EVF indication position adjustment" used for the adjustment of VIDEO, the VIDEO unit can be adjusted by removing the camera unit. For removing the camera unit, disconnect the following 4 connectors;

DC-DC converter must be connected to the VTR unit at this time.

1. VC-62 board CN622
2. VC-63 board CN702
3. VC-63 board CN703
4. SS-93 board CN005

EVF (Electric viewfinder) is necessary only for the "Battery down adjustment".

When removing EVF unit, disconnect the following connector;

1. VA-42 board CN360

Microphone board (MC-28 board) is not required for the adjustment of VIDEO unit. For removing the microphone board, disconnect the following connector;

1. VA-42 board CN361

[Equipment Connection]

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

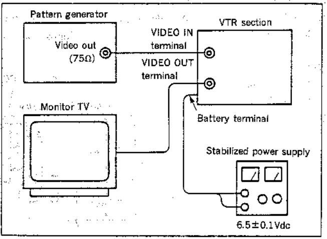


Fig. 3-1.

[Setting up for Adjustment]

Video signals output from an pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard. Connect an oscilloscope to J361 (VIDEO IN) on the VA-42 board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3V respecitively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 3-2 shows video signals (color burst) used in the video section adjustment.

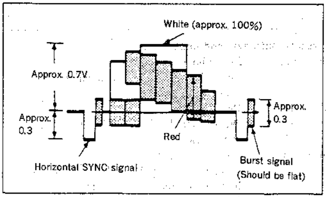
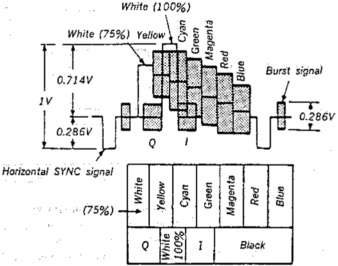


Fig. 3-2. Pattern Generator Color Bar Signals

[Alignment tape]

Tape	Description	Use for
Tracking (WR5-1N)	1. Recording area PCM—Video 2. Recording content: CH2: 1MHz linearity adjustment signal (CH1: 9MHz)	Drum linearity adjustment
Video frequency response (WR5-6N)	1. Recording area Video 2. Recording content RF sweep 0 to 10MHz 3. Marker 1,3.58,5.5 and 7MHz	Frequency response adjustment
Operation checking SP mode (WR5-4NSP) LP mode (WR5-4NL) Note: PCM area is not included in WR5-4NL	1. Recording area Video 2. Recording content ■ Video area ● Video signals Color bar: 4min. Monoscope: 4min. [Color bars]  White (100%) White (75%) Yellow Cyan Green Magenta Red Blue Burst signal 0.714V 1V 0.286V 0.286V Q I Horizontal SYNC signal (75%) White Yellow Cyan Green Magenta Red Blue Q White 100% I Black ● Audio signal (AFM) 400Hz, 60% modulation ■ PCM area ● Audio signal (PCM) 1kHz, 4min. Color 20Hz, 20sec. 400Hz, 20sec. Monoscope 14kHz, 20sec.	Operation checking

[Input/output Level and Impedance]

Video input	Mini phono jack Input signal: 1Vp-p, 75Ω unbalance. sync negative
Video output	Phono jack Output signal: 1Vp-p, 75Ω unbalance, sync negative
Audio input	Mind phono jack Input level: −10dBs (0dBs=0.775Vrms) Input impedance: 47kΩ or more
Audio output	Phono jack Specified output: −10dBs (47Ω at load) Impedance: 2.2kΩ or less

[Service Mode]

This machine in provided with the service mode used for the adjustment and function checks.

1. STARTING SERVICE MODE

When SVP land (K IN 2 (CN160 pin ⑥) and KOUT5 (CN160 pin ⑩)) of FV-4 board are shortcircuited for more than 0.2 sec., the service mode 1 is started and all segment of LCD is turned “ON”. Hereafter, whenever SVP land is shortcircuited, the mode is changed as follows;

Service mode 2
↓
Service mode 3
↓
Service mode 4
↓
Service mode 5
↓
Service mode 6
↓
Service mode 7

The service mode number is shown by the last digit of LCD (Except Service Mode 1).

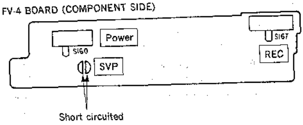

FV-4 BOARD (COMPONENT SIDE)
Power
S160
SVP
S167
REC
Short circuited

Fig. 3-3. SVP land

2. RELEASING SERVICE MODE

For releasing the service mode, set Service Mode 7 and shortcircuited SVP land, thus indicating “-- : -- : --” on LCD. Then push the date button to return to the counter display.

The service mode can also be released by turning “off” the power switch in the service mode.

3. DISPLAY ON LCD

In the service mode, except in the service mode 1, the following codes are displayed ft ①, ②, ③ and ④ on LCD (Liquid crystal display) (Refer to Fig. 3-4)

Section ①

- Service mode 2, 3
  Data of slow tracking control: Initial value BE (1F~FF)
- Service mode 4, 5
  Currently executed operation mode (Refer to Table 3-1)
- Service mode 6
  Battery level
- Service mode 7
  Key code from mode control to mechanical control.

Section ②

- Service mode 2, 3
  Data of JOG VD: Initial value 48 (1F~FF).
- Service mode 4, 5 and 6
  If there is no operation mode to be executed next (Refer to Table 3-1) or there is no new operation command, the currently executed operation mode is displayed.
- Service mode 7
  Displays the warning code for the last trouble occurred while the set is used. Memory is preserved as long as the lithium battery is functioning.

③ Warning code
When a trouble occurs, its cause is shown by one digit code (Refer to Table 3-2).
Note: Service mode 1 and 7 are not included.

④ Service mode No.
Note: Service mode 1 is not included.

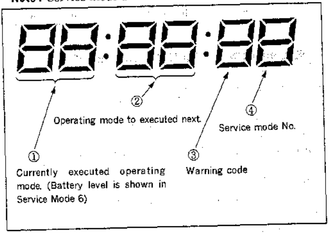

②
Operating mode to executed next
④
Service mode No.
①
Currently executed operating mode. (Battery level is shown in Service Mode 6)
③
Warning code

Fig. 3-4. Display on LCD

Table 3-1. Table of Operating Mode Codes

Code	Operating mode	Code	Operating mode	Code	Operating mode
00	INITIAL	83	REW	46	CUE
01	EJECTED	04	VTR REC	56	REV
11	DEW	14	REC PAUSE	A6	FR SEARCH CUE
31	UNLOADING	44	INSERT	B6	FR SERACH REV
02	STOP READY	54	INSERT PAUSE	07	STILL
12	LOADING	*A4(4)	CAM REC	27	1/5 SLOW
32	STOP BATTERY DOWN	*B4(−4)	CAM STANDBY	47	1/10 SLOW
52	STOP EMERGENCY	85	EDIT CUE	67	FRAME
62	STOP TAPE END	95	EDIT REV	69	REC REVIEW
72	STOP TAPE TOP	06	PB	FF	KEY OFF CODE
03	FF	36	−×1		

*( ) is shown by certain types of machines.

Table 3-2. Table of Warning Codes

Code	Cause of stop for trouble (Trouble is detected by mechanical control, SS-93 board IC001)
0	Normal
1	Trouble with loading/unloading
2	Trouble with capstan speed (pulse is not input into IC001 ⑱ pin (CFG))
3	Trouble with capstan speed (pulse frequency of IC001 ⑱ pin (CFG) is too high).
4	Trouble with reel revolution (pulse is not input into IC001 (63) pin (T REEL FG) or (64) pin (S REEL FG)).
5	Trouble with drum revolution (pulse frequency of IC001 ⑰ pin (DFG) is too high or low).
6	Trouble with drum phase (drum is not phase locked)

4. DESCRIPTION OF EACH SERVICE MODE

[Service Mode 1]

All segments of LCD are lighted.

[Service Mode 2]

Not used for this type.

[Service Mode 3]

Playback mode in which “switching position adjustment” can be made.

[Service Mode 4]

Playback mode in which “CH1’” playback frequency characteristics adjustment” can be made.

[Service Mode 5]

1) Emergency stop by the following trouble detection is prohibited.
   1. Dew detection
   2. Battery down detection
   3. Loading/unloading trouble detection
   4. Drum revolution trouble detection
   5. Drum phase trouble detection
   6. Capstan trouble (NO CFG pulse) detection
   7. Capstan trouble (CFG pulse frequency is too high) detection

[Service Mode 6]

“Battery down adjustment” can be made. Battery level is shown by the two digits on the left side of LCD.

In the CAMERA mode, “><” mark is displayed at the center of lower part of monior TV picture, and “Display position in EVF can be adjusted”.

[Service Mode 7]

This is not used for this type.

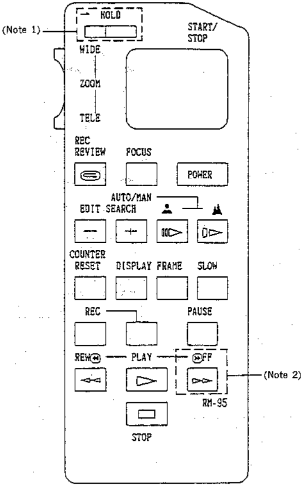
Service Mode by LINCS Commander

1. How to Set Service Mode

The service mode consists of two modes: ADJUST MODE which adjusts EVR and STATUS INFORMATION MODE (hereinafter called STATUS MODE) which indicates the setting status (This model: STATUS MODE only.)
The mode can be changed to STATUS MODE by connecting the service mode commander (HOLD KEY is kept on the service side).

Cf1 Service mode can be discontinued by power OFF or by advancing STATUS No., which returns to the normal mode (Service mode condition).

RM-95 (Partially modified product)


(Note 1)
HOLD
START/
STOP
WIDE
ZOOM
TELE
REC
REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
COUNTER
RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PLAY
FF
(Note 2)
RM-95
STOP

(Note 1)
Hold ON/OFF key for ordinary users serves as the NORMAL/SERVICE selector key for the service man.

(Note 2)
This key is used for advancing the FF NO. NEXT. STATUS NO.

Service Mode Display by LINCS Commander
STATUS MODE consists of the following modes;

MODE		Command display	Set display	Remarks
STATUS INFORMATION	Battery voltage	[Counter] −1 : XX : XX ⇧ ⇧ on/off Battery voltage [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	Battery voltage is the value obtained by dividing by resistance. (Refer to the next page)
	Last memo emergency	[Counter] −2 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	The emergency occurred last while using the set should be stored (memorized) even when the power is turned off (battery OFF). This is called LAST MEMO EMERGENCY. This machine is provided with 6 types of LAST EMERGENCIES (Refer to the next page).
	Present emergency	[Counter] −3 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off Same as NORMAL	⇦ Same as left	

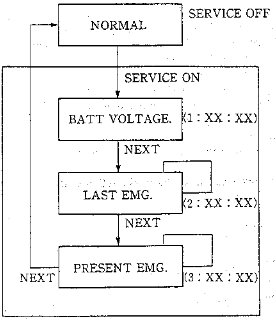
[LINÇS Command]

WORD 0 B0 B7	WORD 1 B0 B7	Command name	
1 1 1 1 1 1 1 1 (Note 1)	0 0 0 1 1 1 0 0 (Note 2)	NEXT	Switches display

Note 1 : ON/OFF of service mode is decided depending on WORD 0, and therefore the service remote control continuously sends 1 1 1 1 1 1 1 1 B to WORD 0 even when commands are not sent.

Note 2 : NEXT WORD is common to the ordinary FF command.

(Service Mode (Status Display) Condition Transition Diagram) by LINCS Commander

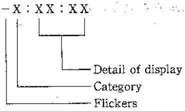

NORMAL
SERVICE OFF
SERVICE ON
BATT VOLTAGE.
(1 : XX : XX)
NEXT
LAST EMG.
(2 : XX : XX)
NEXT
PRESENT EMG.
(3 : XX : XX)
NEXT

* To turn off the service mode (NORMAL) ;

1. Actuate the POWER OFF slide switch.
2. Advance STATUS NO until NORMAL is returned.

Note : When all the required operations are completed, return the service mode to NORMAL.

[Display Method]


-X : XX : XX
Detail of display
Category
Flickers

Category	Detail of display
1	Result of battery voltage A/D conversion (sexadecimal indication). Same indications used when adjusting P. C. board)
2	LAST EMG. (Refer to the table below) (Note 1)
3	PRESENT EMG. (Refer to the table below) (Note 2)

Note 1 : LAST EMG. is not updated even when a trouble occurs during the service mode. Therefore, the LAST EMG. immediately before starting the service mode is stored.

[Displaying Trouble in Service Mode by LINCS Commander]

Condition of trouble	PRESENT EMG. display	LAST EMG.
No trouble	00 : 00	00 : 00
Loading/unloading trouble	00 : 01	00 : 01
No CAP FG	00 : 02	00 : 02
Trouble with CAP high speed revolution	00 : 03	00 : 03
Trouble with REEL revolution	00 : 04	00 : 04
Trouble with drum revolution (0)	00 : 05	00 : 05
Trouble with drum phase (0)	00 : 06	00 : 06

* Indicates the code which is exactly the same as the warning code in the service mode.

3-1. POWER SUPPLY CHECK

3-1-1. VA5V Voltage Check (VA-42 board)

Mode	E-E
Signal	Arbitrary
Measurement point	W361 pin ⑦
Measuring equipment	Digital voltmeter
Specified value	5.05±0.05Vdc

[Check Procedure]

The voltage of W361 pin ⑦ must meet the specified value.

3-2. SYSTEM CONTROL ADJUSTMENT

3-2-1. Battery Down Adjustment (SS-93 board)

Mode	Camera REC
Subject	Arbitrary
Measurement point	+ : BATT (+) terminal − : BATT (−) terminal
Measuring equipment	Digital voltmeter
Adjustment element	RV001
Specified value	When power voltage is 5.76±0.01Vdc and LCD displays the counter, digits of "92" are indicated.

Note 1: A thick short lead wire should be used to connect between the stabilized power supply and the battery terminals BATT (+) and BATT (−) of this machine.

Note 2: Connect the camera unit and EVF unit and adjust them.

[Adjustment Procedure]

1) Set the unit is Service Mode 6 (Refer to Service Mode).
2) Make sure that the power voltage is 6.5±0.1Vdc.
3) Set the machine in the Camera REC mode.
4) Slowly lower the power voltage down to 5.76 ±0.01Vdc.
5) By operating RV001, adjust the two digits on the left side of counter of LCD to "92".

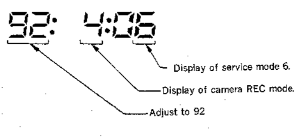


Fig. 3-5.

[Check Procedure]

1) Make sure that the machine is set in Service Mode 6.
2) Set the power voltage to 6.5±0.1Vdc.
3) Switch the power supply from OFF to ON.
4) Switch to CAMERA REC mode.
5) Slowly lower the power voltage down to 5.81±0.01Vdc.
6) Make sure that the battery down warning displayed on LCD is one of the following two ;
   1) 🔋 mark is not displayed.
   2) 🔋 mark is slowly flickering (0.8Hz).
7) Slowly lower the power voltage down to 5.71±0.01Vdc. Make sure 🔋 mark displayed on LCD is quickly flickering.
8) Release the service mode (Refer to [Service Mode]).

3-2-2. Clock Accuracy Check (FC-25 board)

Mode	E-E
Measurement point	IC101 pin ㊾
Measuring equipment	Frequency counter
Adjustment element	CT101
Specified value	2048.000±0.008Hz

[Adjustment Procedure]

1) Adjust to 2048.000+0.008Hz with CT101.

3-3. SERVO SYSTEM ADJUSTMENT

3-3-1. Switching Position Adjustment (SS-93 board)

Mode	Playback
Signal	For alignment tape tracking adjustment (WR5-1NP)
Measurement point	CH1 : CN604 pin ④ (RF OUT) CH2 : IC001 pin ⑭ (RF SWP)
Measuring equipment	Oscilloscope
Adjustment element	RV002
Specified value	0±10μsec

Note : Connect pins ② and ⑧ of CN004 to GND.

[Adjustment Procedure]

1) Adjust RV002 until the marker of RF CH2 waveform coincides with the lowering part of RF SWP waveform.

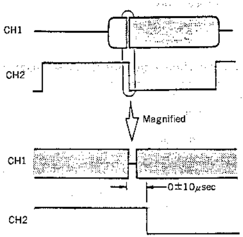


Fig. 3-6.

3-4. VIDEO ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure below. The color video input signal supplied from the pattern generator is used as the video input signal for video adjustment in the RECORD mode. Make sure that the SYNC signal and color burst signal are matched with the standard specified for set-up during adjustment.

[Adjustment Procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Y/C separation adjustment
4) IR2 adjustment
5) Emphasis input level adjustment
6) VIDEO OUT level adjustment
7) PB Y level adjustment
8) Y_D adjustment
9) Y FM carrier frequency adjustment
10) Y FM deviation adjustment
11) Chroma emphasis f_0 adjustment
12) REC Y record current adjustment
13) REC C record current adjustment
14) Indication position in EVF adjustment

3-4-1. Playback Frequency Characteristics Adjustment (SS-93 board)

(1) CH1 and CH2 adjustment

Adjustment of CH2 is shown in (   ).

Mode	Playback
Signal	Alignment tape; For the adjustment frequency characteristics (WR5-6N)
Measurement point	CN004 pin ④ External trigger: SS-93 board CN004 pin ② Trigger slope: +, [−]
Measuring equipment	Oscilloscope
Adjustment element	RV302 [RV301]
Specified value	3.58MHz level: 5.5MHz level=4: 3

[Adjustment Procedure]

1) By operating RV302 (RV301), adjust the ratio between 3.58MHz level and 5.5MHz to 4 : 3 [4 : 3] .

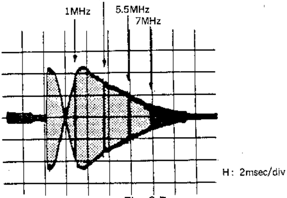


Fig. 3-7.

(2) CH1' adjustment (CCD-F70)

Mode	Service mode 4 playback *1
Signal	Alignment tape; For frequency characteristics adjustment (WR5-6N)
Measurement point	SS-93 board CN004 pin ⑤ External trigger: SS-93 board CN004 pin ② Trigger slope: −
Measuring equipment	Oscilloscope
Adjustment element	RV306
Specified value	3.58MHz level: 5.5MHz level=4: 3

＊1: For the method to start Service Mode 4, refer to [Service Mode] .
When the adjustment is completed, be sure to release the service mode.

[Adjustment Procedure]

1) By operating RV306, set the level ratio between 3.58MHz level and 5.5MHz level to 4 : 3.

3-4-2. Flying Erase Check (SS-93 board)

Mode	Record
Signal	Arbitrary
Measurement point	CN003 pin ⑫ (FE (X))
Measuring equipment	Oscilloscope and frequency counter
Specified value	Frequency: More than 7.5MHz Voltage : More than 7.0Vp-p

Note: Use the MP type tape

[Check Procedure]

1) Make sure that the oscillating frequency is 7.5MHz or more and oscillating voltage is 7.0Vp-p or more.

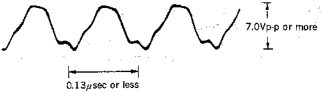


Fig. 3-8.

3-4-3. Y/C Separation Adjustment (VA-42 board)

Mode	E-E
Signal	Color bar
Measurement point	IC360 pin ㉕
Measuring equipment	Oscilloscope
Adjustment element	RV366
Specified value	Minimum residual chroma components

Note: Before making adjustment, connect the capacitor, 10μF, between IC360 pin ㊴ and GND.

[Adjustment Procedure]

1) By adjusting RV366, minimize the residual chroma components.

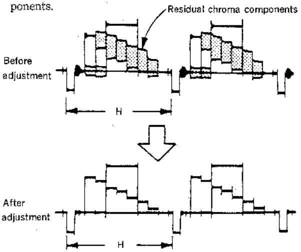


Fig. 3-9.

3-4-4. IR2 Adjustment (VA-42 board)

Mode	E-E
Signal	Color bar
Measurement point	CH1 : IC360 pin ⑤ (REC C RF OUT) CH2 : IC360 pin ⑧ (BF OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV365
Specified value	a=b (Refer to Fig. 3-10)

Note : Before making adjustment, connect the resistor, 10kΩ, between IC360 pin ⑧ and GND.

[Adjustment Procedure]

1) Adjust RV365 until the following position of burst pulse of CH2 (BF OUT) coincides with the center of burst signal of CH1 (REC C RF OUT). (Refer to Fig. 3-10).

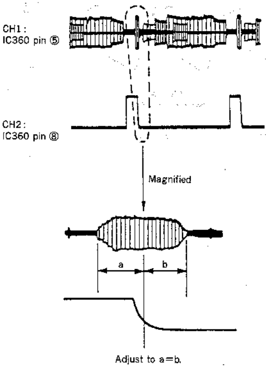


Fig. 3-10.

3-4-5. Emphasis Input Level Adjustment (VA-42 board)

Mode	E-E
Signal	Color bar
Measurement point	IC360 pin ㉚
Measuring equipment	Oscilloscope
Adjustment element	RV369
Specified value	0.50±0.02Vp-p

[Adjustment Procedure]

1) By operating RV369, adjust the value to 0.50±0.02Vp-p.

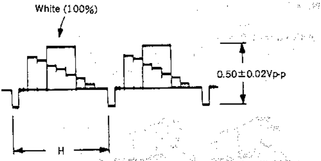


Fig. 3-11.

3-4-6. VIDEO OUT Level Adjustment (VA-42 board)

Mode	E-E
Signal	Color bar
Measurement point	VA-42 board J361 (VIDEO OUT)
Measuring equipment	Oscilloscope
Measuring element	RV360
Specified value	1.00±0.05Vp-p

Note : J361 (VIDEO OUT) must be terminated at 75Ω.

[Adjustment Procedure]

1) Adjust to 1.00 ±0.05Vp-p with RV360.

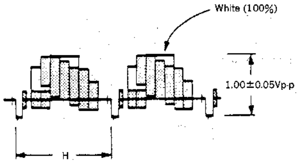


Fig. 3-12.

3-4-7. PB Y Level Adjustment (VA-42 board)

Mode	Playback
Signal	For operation checking (WR5-4NSP) Color bar section
Measurement point	VA-42 board J361 (VIDEO OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV362
Specified value	1.00±0.05Vp-p

Note 1 : Make sure that EDIT switch (PA-24 board S990) is off.

Note 2 : J361 (VIDEO OUT terminal) should be terminated at 75Ω.

[Adjustment Procedure]

1) Adjust to 1.00±0.05Vp-p with RV362.

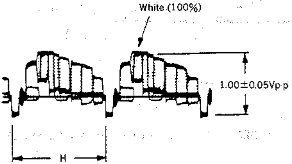


Fig. 3-13.

3-4-8. Y_D Adjustment (VA-42 board) (CCD-F70)

Mode	Playback+Pause
Signal	For operation checking of (WR5-4NSP) Color bar section
Measurement point	Check with monitor TV
Measuring equipment	Check with monitor TV
Adjustment element	RV367
Specified value	Make Y flicker incospicuous

[Adjustment Procedure]

1) Adjust RV367 until Y flicker on monitor screen becomes unconspicuous.

3-4-9. Y FM Carrier Frequency Adjustment (VA-42 board)

Mode	E-E
Signal	No signal
Measurement point	IC360 pin ㊾
Measuring equipment	Frequency counter
Adjustment element	RV364
Specified value	4.20±0.05MHz

[Adjustment Procedure]

1) Adjust to 4.20±0.05MHz with RV364.
2) Make "Y FM Deviation adjustment".

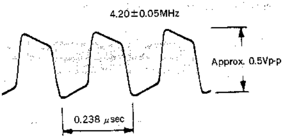


Fig. 3-14.

3-4-10. Y FM Deviation Adjustment (VA-42 board)

Mode	Recording and playback
Signal	Color bar
Measurement point	VA-42 board J361 (VIDEO OUT)
Measuring equipment	Oscilloscope
Measurement element	RV363
Specified value	Playback level should be 1.00±0.5Vp-p

Note 1 : Make sure that "VIDEO OUT level adjustment", "PB Y level adjustment" and "Y FM carrier frequency adjustment" have been completed.

Note 2 : EDIT switch (PA-24 board S990) must be turned "OFF".

Note 3 : J361 (VIDEO OUT) should be terminated at 75Ω.

[Adjustment Procedure]

1) Record the color bar signal.
2) Playback the recorded signal.
3) Check the played output level.
   Specified value : 1.00±0.05Vp-p
4) If the specified value is not met, turn RV363 as shown below and repeat the above 1)~3) :

	Turning direction of RV363
When shown value is greater than the specified value	Counterclockwise (↺)
When shown value is smaller than the specified value	Clockwise (↻)

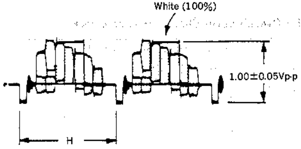


Fig. 3-15.

3-4-11. Chroma Emphasis fo Adjustment (VA-42 board)

Mode	E-E
Signal	Color bar
Measurement point	IC360 pin ⑤
Measuring equipment	Oscilloscope
Adjustment element	FL360
Specified value	fo component ; Minimum

[Adjustment Procedure]

1) By adjusting FL360, minimize the amplitude of the flat portion of chroma signal.

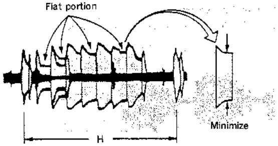


Fig. 3-16.

3-4-12. REC Y Record Current Adjustment (VA-42 board)

Mode	Record
Signal	No signal
Measurement point	SS-93 board CN004 pin ③ (REC RF)
Measuring equipment	Oscilloscope
Adjustment element	RV361
Specified value	210±10mVp-p

Note : When the adjustment of REC Y recording current is completed, be sure to adjust each recording current of REC C, REC AFM and REC ATF.

[Adjustment Procedure]

1) Adjust RV361 until 210±10mVp-p is obtained.

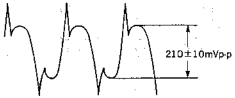


Fig. 3-17.

3-4-13. REC C Recording Current Adjustment (VA-42 board)

Mode	Record
Signal	Color bar
Measurement point	SS-93 board CN004 pin ③ (REC RF)
Measuring equipment	Oscilloscope
Adjustment element	RV368
Specified value	130mVp-p

Note 1 : When the adjustment of REC C recording current is completed, be sure to adjust each recording current of REC AFM, REC ATF.

Note 2 : Be sure to use the MP type tape.

[Adjustment Procedure]

1) Adjust RV368 until 130mVp-p is obtained.

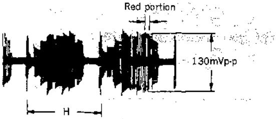


Fig. 3-18.

3-4-14. Indicated Position in EVF Adjustment (VA-42 board)

Mode	Camera stand-by
Subject	Arbitrary
Adjustment element	CV360
Specified value	Set "X" mark at the center of monitor screen

[Adjustment Procedure]

1) Adjust to Service Mode 6 (Refer to "Service Mode" on page 213).
2) Adjust CV360 until "X" mark is set at the center (a=b) of monitor screen (Refer to Fig.3-19).

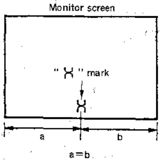

Monitor screen
"X" mark
a
b
a=b

Fig. 3-19.

3) Release the service mode (Refer to Service Mode).

3-5. AUDIO SYSTEM ADJUSTMENT

Make adjustment by inputting the color bar signal to VIDEO IN terminal.

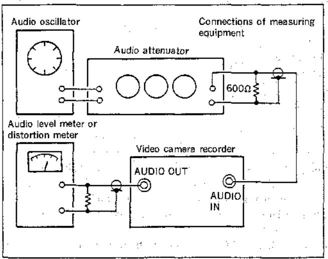

Audio oscillator
Connections of measuring equipment
Audio attenuator
600Ω
Audio level meter or distortion meter
Video camera recorder
AUDIO OUT
AUDIO IN

Fig. 3-20.

3-5-1. E-E Output Level Check

Mode	Record
Signal	400Hz, −7.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±2dBs

[Check Procedure]

1) Audio output level must be −7.5±2dBs.

3-5-2. Overall Level Characteristics Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±3dBs

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Audio output level should be −7.5±3dBs.

3-5-3. Overall Distortion Factor Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Distortion meter
Specified value	0.5% or less *1

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Distortion factor should be 0.5% or less.

*1 This is the value when the distortion factor measuring filter (Fig. 3-21) is used. It should be 1.0% or less, if the filter is not used.

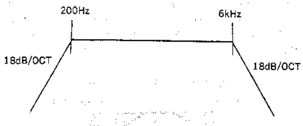


Fig. 3-21.

3-5-4. Overall Noise Level Check

Mode	Self recording and playback
Signal	No signal Connect the load resistor, 600Ω, between AUDIO IN terminal and GND
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−66dBs or less *2

[Check Procedure]

1) Recored the signal.
2) Playback the recorded portion.
3) Noise level should be −66dBs or less *2.

*2 This is the value when IHF-A auditory sense correction filter is used.

3-6. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

3-6-1. Adjusting Horizontality/Inclination

Mode	Playback
Signal	Monoscope
Specified value	Refer to Fig. 3-23

[Adjustment Procedure]

1) Adjust Volume Array D (Bright) in such a way that the brightness of CRT becomes suitable to be seen (Refer to Fig. 3-24).
2) Loosen the DY (Deflection Yoke) clamping nut (Refer to Fig. 3-22).
3) Set the picture on the horizontal level by turning DY.
4) Tighten the DY clamping nut (Do not tighten excessively).

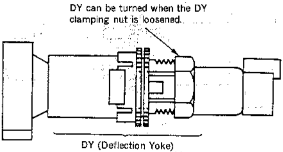
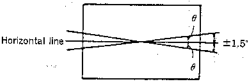


Fig. 3-22.



specified value: Make sure that the picture is kept within ±1.5° of horizontal line.

Fig. 3-23.

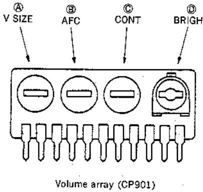


Fig. 3-24.

3-6-2. Centering Adjustment

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-4NSP)
Specified value	Refer to Fig. 3-26

[Adjustment Procedure]

1) By operating the centering magnet, adjust the position of picture until the upper, lower, left and right sides of picture are kept uniform.

Note: The centering position is changed by the effect of earth magnetism.
Turn the magnet 360° in horizontal direction and adjust at the center of displacement.

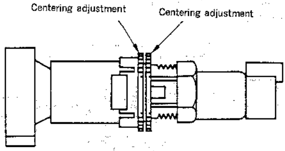


Fig. 3-25.

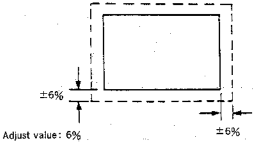


Fig. 3-26.

3-6-3. AFC Adjustment (VF-13 board)

Mode	E-E or camera stand-by
Signal	Color bar
Measurement point	C915 ⊕ side
Measuring equipment	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ
Specified value	2.6±0.1Vdc

[Adjustment Procedure]

1) Adjust volume array Ⓑ until 2.6±0.1Vdc is obtained (Refer to Fig. 3-24).

3-6-4. Horizontal Amplitude Adjustment (VF-13 board)

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-4NSP)
Adjustment element	C905
Specified value	6±3%

[Adjustment Procedure]

1) Set the focus with RV901.
2) By turning volume array Ⓐ, fit the upper part and lower part of monoscope picture to the respective upper and lower edges of screen.
(Refer to Fig. 3-27).
3) Turn the volume array until the normal level of brightness is obtained.
4) Shortcircuit or open the pattern (A) of H size adjust capacitor (C905) so that the overscan in horizontal direction becomes 6±3% (Left−right total). (Refer to Fig. 3-28).

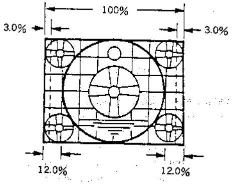
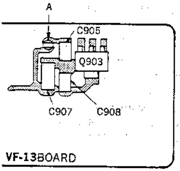


Fig. 3-27.



A	H size
Open	small ↕
Short	Large

Fig. 3-28.

3-6-5. Vertical Amplitude Adjustment (VF-13 board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-4NSP)
Adjustment element	Volume array Ⓐ
Specified value	6±3%

[Adjustment Procedure]

1) With volume array Ⓐ, set the vertical overscan to 6±3% (upper/lower total).

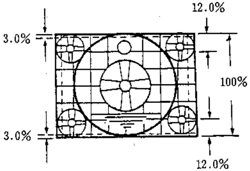

12.0%
3.0%
100%
3.0%
12.0%

Fig. 3-29.

3-6-6. Brightness/Contrast Adjustment (VF-13 board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-4NSP)
Adjustment element	Brightness: Volume array Ⓓ Contrast : Volume array Ⓒ

[Adjustment Procedure]

1) Alternately adjust volume arrays, Ⓓ and Ⓒ until the contrast of gray scale is properly displayed.
(The bright portion should not be so bright as the contrast of gray scale is clearly shown. The dark portion should not be so dark as the difference between the first section (darkest place) and the 3rd section of gray scale is not clearly identified).

3-6-7. Focus Adjustment (VF-13 board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-4NSP)
Adjustment element	RV901

[Adjustment Procedure]

1) Adjust to the best focus point with RV901.

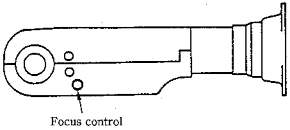

Focus control

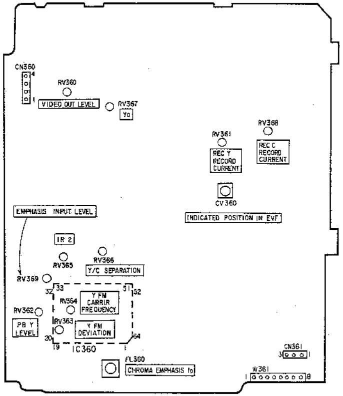
Fig. 3-30.

3-6-8. Horizontal Amplitude and Vertical Amplitude check

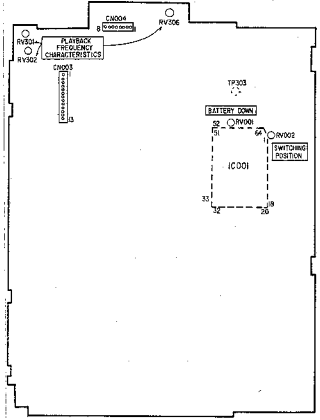
Make sure that 3-6-4 Horizontal Amplitude Adjustment and 3-6-5 Vertical Amplitude Adjustment are within the specified range. When the specified value is not met, make readjustments. In such a case, 3-6-6 Brightness/Contrast Adjustment and 3-6-7 Focus Adjustment should also be made at the same time.

3-7. PARTS LOCATION DIAGRAMRELEVANT TO THE ADJUSTMENTS

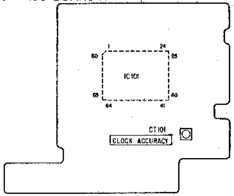
VC-42 BOARD(COMPONENT SIDE)


CN360
4
1
RV360
VIDEO OUT LEVEL
RV367
Yo
RV368
RV361
REC Y RECORD CURRENT
REC C RECORD CURRENT
CV360
INDICATED POSITION IN EVF
EMPHASIS INPUT LEVEL
IR 2
RV365
RV366
Y/C SEPARATION
RV369
32
33
51
52
RV364
Y FM CARRIR FREQUENCY
RV362
PB Y LEVEL
RV363
Y FM DEVIATION
20
19
64
1
IC360
FL360
CHROMA EMPHASIS fo
CN361
3
1
W361
1
8

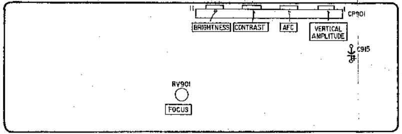
SS-93 BOARD (CONDUCTOR SIDE)


CN004
8
1
RV306
RV301
PLAYBACK FREQUENCY CHARACTERISTICS
RV302
CN003
1
13
TP303
BATTERY DOWN
52
RV001
51
64
1
RV002
SWITCHING POSITION
IC001
33
32
20
18

FC-25 BOARD(COMPONENT SIDE)


1
24
80
25
IC101
65
40
64
41
CT101
CLOCK ACCURACY

VF-13 BOARD(COMPONENT SIDE)


11
1
CP901
BRIGHTNESS
CONTRAST
AFC
VERTICAL AMPLITUDE
C915
RV901
FOCUS